PULP & PAPER INDUSTRY

DECEMBER, 1945 "The Cellulose Age" Vol. 19 • No. 12

CHRISTMAS TREES, 1945 VERSION, IN STOCKHOLM! THIS MIGHT HAVE BEEN PULPWOOD. But instead of being stacked alongside a mill conveyor, here are eight rows (count 'em) stacked for miles on Stockholm streets to heat apartments. Even pulp mills burn pulpwood. Nine sulphite mills will evaporate effluent for fuel . . . *See page 10.*

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PULP & PAPER INDUSTRY

"The Cellulose Age"

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EDITORIALS

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FRIENDS OF THE INDUSTRY

TIME, INC., has purchased a third mill within a period of only a few months, the latest acquisition being the Hennepin Paper Co., at Little Falls, Minn. The others are Bryant at Kalamazoo and Maine Seaboard at Bucksport, Me. Meanwhile, St. Regis, one of the companies supplying Time-Life-Fortune, has acquired Watab Paper Co., Sartell, Minn.

Time, Inc., is not only buying mills and cooperating closely with other mills in an effort to assure itself of about 250,000 tons of paper annually, but it is spending millions in research work to benefit the entire paper industry as well as themselves. Time and other magazine publishers, as well, are cooperating with mills to protect their supply and are taking a long range view toward assisting in permanent successful development of the pulp and paper industry on this continent.

Perhaps this attitude and these tactics may seem to contrast rather sharply with the lack of concern which many newspapers seemed to show over the welfare of the pulp and paper industry in the past two decades. There were times when the press might have taken a stand which would have been appreciated by a pulp and paper industry, beset with unfair competition.

Even today the deeds and words of the magazine interests contrast sharply, in some instances, with what has been issuing from associations and organs of the newspaper publishers. The latter are becoming very alarmed—almost frantically so—over decreasing amounts of newsprint available to them.

There has been publicity in the magazine, Editor & Publisher, stating that newspapers in the Far West have been cut off from their supply by newsprint mills. Some of this publicity has placed paper mills in an unfavorable light, despite the fact that several of them are continuing to make newsprint at an actual loss in money. Instead of putting mills on the spot—making them "ration" newspapers—why can't newspapers direct their own dividing up of the dwindling supply of newsprint?

A CASE IN POINT

THE California Newsprint Publishers Association, through its President, E. R. Lovett, sent a letter to the Boren Congressional Newsprint Sub-Committee of Congress, which—while favoring continuance of some kind of controls—asserted that Hawley Pulp & Paper Co., was operating at no better than 50% and had no prospect of improvement until April or May. Also, that Crown Zellerbach had notified customers of certain large reductions under "what they are entitled to receive under L 240." Despite the anxiety of Mr. Lovett to make a point, these statements were not fair to two important western industries which have long loyally served their newspaper customers and are still doing more for them than could be considered necessary under today's conditions.

On Nov. 14—just the day after Mr. Lovett wrote—Hawley began to run its newsprint machine seven days a week and so was operating at 100% on its newsprint capacity again. Crown Zellerbach had never stated, as Mr. Lovett reported, that its customers must expect a large percentage cut, but it merely advised them that full WPB quotas were simply unavailable.

The reason Hawley started up 100% was because the Willamette River came up to permit pulp grinding by water power. But insufficient logs forced it to receive logs from a competitor and so one-third of its newsprint will go to its competitors' customers. With the lumber strike over, Hawley hopes to take care of all of its customers except one small paper, and it arranged to ship a carload of paper to this paper to take care of it through March.

There's a newsprint committee in Congress, but it may be noted there are no committees for other types of papers. Perhaps a committee for the pulp and paper industry would not be out of order.

In all the numerous reports in the newspapers on the lumber strike, virtually no notice was given that it closed two pulp mills and imperiled newsprint supply by cutting down the log inventories of all western mills to a dangerous level.

EUROPEAN FUEL CRISIS STIMULATES RESEARCH IN SULFITE LIQUOR USE

Two Systems in Use for Converting Effluent

The critical fuel and power shortage which is gripping all of Europe this winter is dramatized in the Stockholm street scene published on cover of this issue of PULP & PAPER INDUSTRY.

One of the results of this situation in Scandinavian countries has been the stimulation of studies and developments in the evaporation and burning of waste sulfite liquor as a fuel for power.

The systems in vogue in Sweden are big investments, but are reported to be necessary as a supplementary source of fuel supply. The steam cost with fossil fuel is several times higher than it is for many of the big North American pulp mills.

However, a search for new sources of fuel for the sulfite mills of this continent is already on, stimulated on this side of the Atlantic by rising costs or shortages in fuel materials now being used. Some of the ideas developed in Sweden, or modifications of them, as well as new ideas now being tested or soon to be tested in the U. S. and Canada, are going to be closely watched by the North American sulfite industry.

On this side of the Atlantic, the trials are taking the form of substituting new chemical cooking bases for the traditional calcium base of the sulfite industry. In Sweden, the experiments are based on continued use of calcium, in some cases.

Interest in evaporating and burning sulfite liquor in Sweden was stimulated all during the war period because of the lack of fossil fuel. Two systems have been developed there for evaporation of sulfite liquor, namely, the Ramens and Rosenblads systems. Even protaganists of these systems admit their work has not yet been "finalized" but, meanwhile, a committee representing all the most important sulfite mills in that country has been organized and is studying all the problems connected with the evaporation of this kind of mill effluent.

Involved in the new developments in Sweden are other problems besides the evaporating problem. The content of ash in the waste sulfite liquor is high and as yet no use for the ash has been discovered. The content of sulfur dioxide in the stack gases is also compartively high, but so far no inconvenience from this fact has been observed in Sweden, according to the visitors from that country.

GUSTAF EDLING, Vice President, Swedish Steam Boiler Users Assn., Stockholm, who made North American tour. At Pacific Coast TAPPI meeting he described methods in vogue in Sweden for sulphite liquor evaporation and conversion.

Despite high cost, conversion of liquor to fuel is economically essential because of Europe's critical fuel shortage.

Visitors from Sweden

Three men who have been touring the United States and Canadian mills in recent weeks are leaders in these developments in Sweden. They brought to the management of pulp and paper mills on this continent the latest word on these accomplishments in the Scandinavian countries.

Two of these men—Folke N. H. Setterwall, director and foreign manager of the Rosenblads company and Karl Lockman, chief engineer of the company—visited mills and company offices in Washington State during the first half of November. Later in the month they visited mills and offices in Quebec, crossing the continent by Canadian Pacific railroad. They were planning to follow this up by a trip to Wisconsin, where important studies are being undertaken by the industry in disposal and utilization of sulfite waste liquor.

Halvar Lundberg, Textile Tower, Seattle, their official representative in the west, accompanied Mr. Setterwall and Mr. Lockman on that part of their tour. Incidentally, Mr. Lockman made a fast trip from Sweden—four and one-half days to Seattle, including a one-day stopover in Iceland and two days in New York! Mr. Setterwall has been in the United States and Canada since mid-October, but he crossed the Atlantic on a seat-less freight transport plane.

The third visitor from Sweden is Gustaf Edling, vice president of the Swedish Steam Boiler Users Association, of Stockholm, who preceded his two countrymen on their tour and was at the TAPPI meeting in Camas Oct. 9, at which a panel discussion was held on the disposal and utilization of sulfite waste liquor. Mr. Edling joined in this discussion, describing both the Ramens and Roseblads systems.

He said that evaporation, rather than the burning, of the sulfite liquors, has been the real headache for the Swedes. Under certain conditions, he conceded, it has not been possible to avoid the scale formation which makes evaporation of calcium base liquors so difficult.

Under the Ramens system, Mr. Edling said liquor is dried to practically dry solids, whereas under the Rosenblads system, evaporation is carried no further than 50-60% solids.

His description of the two methods and further comparisons are published on page 58 of this issue, in the second and final installment of PULP & PAPER INDUSTRY'S complete report on the recent TAPPI Panel discussion at Camas, Wash., on "Utilization and Disposal of Sulfite Liquor." (For first half of report see Nov. issue.)

The Rosenblads patents for converting waste liquor to fuel are in operation in six Swedish pulp mills where they still continue to cook with calcium liquors. Three others now are installing the system. The Rosenblads patents also cover the

Mills Even Burn Their Pulpwood Many Homes are Heated by It

operation at the Toten bleached sulfite pulp mill on Lake Mjoesen, Norway, where ammonia is used as a substitute for calcium in the cooking process and which was described in the October, 1945, issue of PULP & PAPER INDUSTRY (page 24).

Setterwall Describes Process

"A couple of years before the war the Rosenblads company started to work on this problem and erected plants for the evaporation of waste sulfite liquor," Mr. Setterwall told PULP & PAPER INDUSTRY. "Careful tests were made. Different chemicals were added to the waste liquor to see if the deposits of gypsum on the heating surfaces could be avoided or were added to the wash water to see if the deposits already formed could be washed away.

"In collaboration with the pulp industry, the Rosenblad company developed a simple system to wash the evaporators without disturbing the regular work of evaporation plants. The evaporators used in the new Rosenblad plants are not built of tubes but are built of stainless steel sheets, forming two equal channels. In one channel the liquor to be evaporated is circulated and in the other channel live steam is put through or steam from the foregoing effect of the multiple effect evaporation plant. After a certain period of time the liquor is switched over to steam channel and the steam to the liquor channel. The condensed waters of the steam have shown themselves capable of dissolving the gypsum scale formed during the time the liquor passed through that channel. In this simple way the heating surfaces are kept practically clean and the efficiency of the evaporators is not decreased."

Mr. Setterwall said tests have been made on both acid waste liquor coming directly from the digesters and on slop emanating from the alcohol plant which is usually annexed to the sulfite pulp mill in the Scandinavian countries.

"So far it has proved possible to handle waste liquor up to a temperature of 250°F," he declared. "It is consequently possible to build evaporation plants for pressure higher than the atmospheric pressure. Steam coming from the evaporators can probably now be used for different low pressure consumers in the mill —for instance, for heating the driers, for the bleaching plant, for an alcohol plant. Generally the waste liquor is evaporated to 52% solids. This liquor is fired under the boilers in about the same way as oil is fired. It has been proved that the liquor of 52% solids is easily fired if other fuels are used at the same time, such as wood or coal, to an extent corresponding to about 30% of the total heat content led to the fire room of the boiler. In most cases this proportion between waste liquor and other fuel corresponds very well to what is needed in a sulfite mill. The amount of waste liquor available should be sufficient for the system in, say, the largest sulfite is not equipped with driers or bleaching plant or any other steam consumer in excess of the digesters."

The installation of the Rosenblads system in, say, the largest sulfite mill operations would cost substantially over a million dollars, a matter of investment which may be regarded by management in the mills as requiring comparison with the cost or degree of scarcity of other fuels.

It was described by the Swedish visitors here as an economically essential investment for some Swedish mills. The picture on the cover of this issue does not exaggerate the situation abroad. The U. S. Army gave up its attempts to get the French paper mills started up at an early date after the war, when their paper was needed for the army, because of the desperate shortage of coal.

25% of Pulpwood Burned

In Sweden this winter, it is reliably reported that more than 25% of pulpwood is being diverted to fuel purposes. Even the Stockholm palace of King Gustav is burning wood in its furnaces this winter—instead of coal. The extent of this calamity is brought out more sharply by reports of travelers that Southern Sweden has heavily overcut its timber during the war.

Some pulp mills, in order to keep going, have been burning pulpwood for steam production, a very costly process. All the available coal goes to heavy industries or other major essential users. Although Sweden made treaty with Poland immediately after the war's end to bring in coal from that country, the hopeless tangle of the Polish railroad systems and damage done in its new-won seacoast harbors has prevented all but a small trickle of this coal from reaching Sweden. Demands on Poland from Russia also have diverted coal, it is said by recent visitors in Sweden. Coal is even being shipped all the way to Sweden from the United States, and these shipments were carried on even during the coal strike in United States.

In late December or January it is going to be even more difficult and more expensive to get any outside fuel supplies to Swedish pulp mills, which will be isolated from water routes by the freeze-up of the Baltic Sea. For the winter months pulp shipments outward and fuel shipments inward are only possible by the expensive overland routes. Because of the freeze, deliveries of pulp from Europe are halted until April or May.

It is interesting to note that new problems of fuel supply in North America are turning the attention of those mills to a study of the practical possibilities of using the sulfite effluent for that purpose. The sulfate industry over many years has demonstrated the most valuable "by-product" it has developed from its mill effluent is fuel. There are a number of leaders in the management and technical fields of the sulfite industry who believe that their industry may come to similar conclusions—that the most valuable use

WILLIAM M. McNAIR, U. S. Army Air Forces, prior to his promotion to captain. He has returned to position as a Midwest Representative, Pulp Div., Weyerhaeuser Tmbr. Co., 400 West Madison St., Chicago.
He was Combat Intelligence Officer on the first B-29 operations against Japan and Manchuria from China. Before that he was based in India, the Galapagos Islands and Central America.

He is brother of C. I. McNair, Jr., Vice Pres. in charge of Manuf., Northwest Paper Co., with mills at Cloquet and Brainerd, Minn.

that can be made of the sulfite waste liquor is as fuel.

It, of course, is not an acute problem in this country and Canada as in Scandinavian countries. For instance, steam produced from imported coal or other available fuel, now costs Swedish sulfite mills about $1.20 per thousand pounds, while it is said that steam from evaporated liquors can be produced at 30 cents or less per 1,000 lbs.

Pacific Northwest Fuel Supply

In the Pacific Northwest sulfite mills, for example, oil is used at approximately similar cost and hogged fuel is still cheaper. But introduction of hydraulic log barking in the west, the trend toward more complete use of wood, even of sawdust, is rapidly reducing the available supplies of hogged fuel. However, the opinion is held by some engineers that much can be done to use hogged fuel much more efficiently and therefore even more cheaply.

Some leaders predict that in a few years there will be hogged fuel available only in small, isolated operations. Hydraulic log barking in the west, by eliminating much cutting up of logs and also doing a cleaner barking job, increases the amount of a log that goes into pulp by 20% or even more.

As for oil, many of the oil companies themselves have plainly indicated that it becomes more difficult to obtain. One company stated that California production, its surveys show, has passed its peak. The Texas Co. believes U. S. may be importing oil in about three years. A seven ocean navy for the U. S. and development of aviation is going to make it more difficult for pulp mills to get oil.

Uncertainties of supply for industry and a difficult labor situation make the future for coal use in pulp and paper mills very clouded in some sections of North America.

A great deal of thought and attention is being given to expanding resources of electric power, but here are questions of government cost of operation, politics, etc.

However, in North America the pulp and paper industry is now in accord that one fact stands out—wood is rapidly becoming too valuable to use as a fuel in any form except possibly that part that goes into the pulp mill streams.

In the Scandinavian countries, where forest resources have been closely used and husbanded for generations, it is a tragic development that good pulpwood must now be burned.

Problems of Paperboard Industry

IRVING OSBORNE, JR., President of Cornell Wood Products Co., Cornell, Wis., who on Nov. 15 in New York was elected to his second one year term as President of National Paperboard Ass'n.

This was only three weeks after he was honored by election to the Board of Trustees of the Institute of Paper Chemistry, Appleton, Wis., succeeding the late HUGH STRANGE.

Mr. OSBORNE, who is also President of Hummel & Downing Co., Milwaukee, has offices at 230 North Michigan Ave., Chicago.

Additional efficient manufacturing facilities are needed in the paperboard industry of the United States, the National Paperboard Association was told by its president, W. Irving Osborne, Jr., at annual meeting in New York Nov. 15-16.

Mr. Osborne, who heads Cornell Wood Products Co., was re-elected to a second term as was the vice president, Joseph S. Miller, of New Haven (Conn.) Pulp & Board Co.

In analyzing the "health" of the paperboard industry, Mr. Osborne said "our long history of operating at a rate of capacity much too low for a healthy industry warrants a word of caution."

From 1926 to 1940, the industry never operated above 78%, and usually below 70%.

But "near capacity" operation in war years also brought its disadvantages—failure to supply all customers, operating inefficiencies which raised costs, and poor quality waste paper and pulp—making the industry "vulnerable to competing products," he said.

It was predicted that U. S. paperboard production in 1945 would reach 7,870,000 tons, or 0.7% below the all-time recording breaking output of 1944 of 7,922,900 tons (93% capacity). This slight loss was due to V-E and V-J shutdowns.

Mr. Osborne cited a trend away from integration in the container industry — seemingly in contrast with the trend in paper and boxboard mills. Only 42% of board mills consumed their production in their own fiber box plants in 1944, as compared with 58.4% in 1935. However, 66.7 of folding boxboard was fabricated by the original manufacturers in 1944 as compared with 57.9% in 1935.

Most pressing problems of the industry, he said, were:

1. Supplying customers adequately and with quality.

2. Maintaining operation despite OPA price regulations.

3. Maintaining harmony with labor and an efficient class of help.

Governments' Aims

Ralph A. Powers, of Robertson Paper Box Co., Montville, Conn., former director of the Paperboard Div., Forest Products Bureau, War Production Board, said: "It is my hope the paperboard industry will cooperate with the Civilian Production Administration (which succeeded WPB) so Washington will not find it necessary to issue directives." He said Washington officials will want to be sure "the small business man and small plant" obtain enough paperboard to remain in business.

He said George Johnson, recently resigned from the U. S. Navy, now heads a Forest Products Division of CPA and there are no separate paper or paperboard divisions.

Fifty-six of the 96 member companies of the association were represented at the meeting. Members elected to an executive committee, headed by Mr. Osborne and Mr. Miller, follow:

W. J. Alford, Jr., Continental Paper Co., Ridgefield Park N.J.; W. H. Beckwith, Morris Paper Mills, Morris, Ill.; W. M. Dixon, Container Corp. of America, Chicago, Ill.; George E. Dyke, Robert Gair Company, Inc., New York; Sidney Frohman, The Hinde & Dauch Paper Co., Sandusky, O.; E. T. Gardner, The Gardner-Richardson Co., Mid-

dletown, O.; Alan G. Goldsmith, The Mead Corp., Chillicothe, O.;

J. H. Hinman, International Paper Co., New York; John W. Kieckhefer, Kieckhefer Container Co., Milwaukee; C. E. Nelson, Mac Sim Bar Paper Co., Otsego, Mich.; Elis Olsson, The Chesapeake Corp. of Virginia, West Point, Va.; D. H. Patterson, Jr., Fibreboard Products, Inc., San Francisco, Calif.; S. M. Phelan, Jr., West Virginia Pulp and Paper Co., New York; H. D. Schmidt, Schmidt & Ault Paper Co.; York, Pa., and Marvin W. Swaim, Alton Box Board Co., Alton, Ill.

Canadian Industry Meets Jan. 23-25

The Canadian industry meetings are now set for Jan. 23-25 at the Mount Royal hotel, Montreal, thus preceding by more than four weeks the big "Paper Week" in New York.

The latter is set for Feb. 25 to 29 and, as usual, management and sales meetings will be at the Waldorf-Astoria and technical sessions at the Commodore.

The Canadian Technical sessions will be keyed to the new interest in Canada in sulphate, bleaching of all pulps, use of wood waste, printing papers, etc.

$1,000,000 Board Mill To Be Built in Jersey

A new $1,000,000 paperboard mill to be erected on the premises of Gibraltar Corrugated Paper Company, Inc., North Bergen, N. J., has been announced by H. L. Joachim, vice president of Gibraltar and in charge of the project for the company.

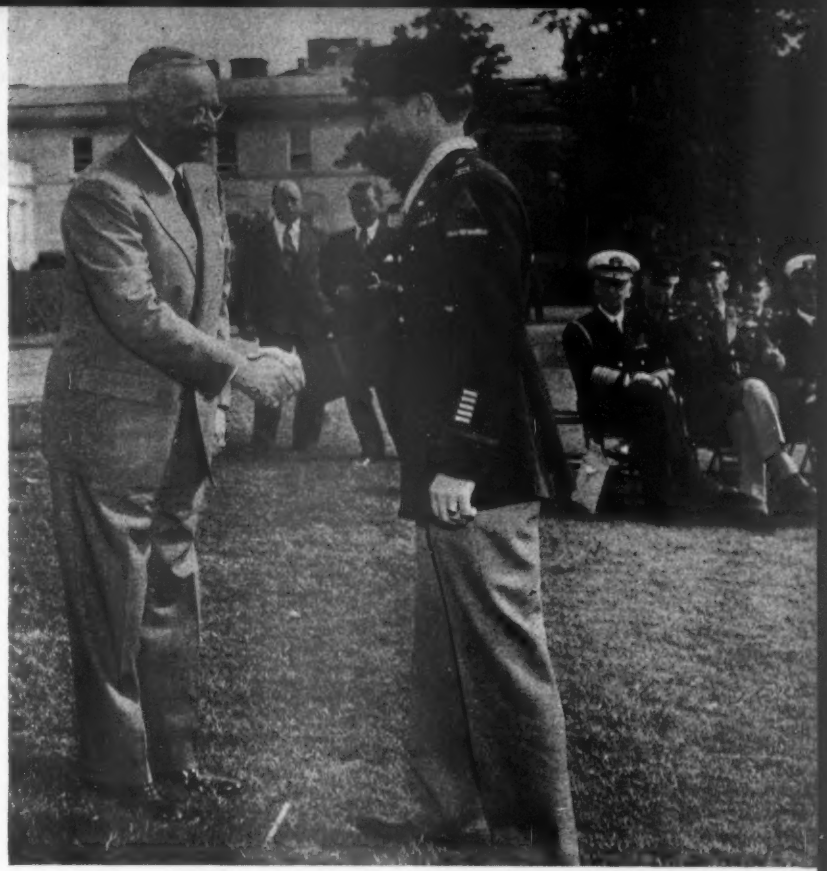
The mill will consist of a 140-inch cylinder machine with complete steam and power generating facilities. The mill is expected to be in operation by next June.

Construction contract has been awarded to M. Shapiro and Sons Construction Co., of New York. Johnson and Wierk, Inc., of New York, are consulting engineers.

Lieut. Kurth, U. S. Navy, Returns to Lufkin

Lieut. Ernest Lynn Kurth, Jr., son of E. L. Kurth, president of Southland Paper Mills, Lufkin, Texas, has been discharged through the Navy's personnel separation center in Memphis, Tenn.

Lieut. Kurth served forty months in the U. S. Navy, including eight months of sea duty. He will return to Lufkin and will take on a position in the Angelina County Lumber Co., which his father also heads.



RECEIVING CONGRESSIONAL MEDAL OF HONOR—his country's highest military decoration—from PRESIDENT TRUMAN is CAPT. JAMES M. BURT, who led his men into battle at Aachen, Germany, riding on top a tank. He was wounded.
Mr. BURT is returning to his pre-war position as a Chemist at HURLBUT PAPER CO., South Lee, Mass.
This picture was taken on the White House lawn. Note the distinguished trio on the bench at right (left to right): ADMIRAL WM. D. LEAHY; GENERAL GEORGE C. MARSHALL (who is applauding his honored officer) and ADMIRAL ERNEST KING. These top men of the armed services were the Big Three in directing U. S. war strategy.

New England Paper Mill Chemist Wins Highest Military Honor

The pulp and paper industry may be proud of the picture on this page. It shows a chemist from one of New England's small, fine-paper mills receiving at the hands of his President, the highest honor of military service.

Capt. James M. Burt, in the bitter fighting just a year ago at Aachen, Germany, rode on top of a tank, waving his men on to victory in the big battle at that northwest gateway of Germany. He was wounded by enemy fire but not until after his example had inspired success.

Wearing on his shoulders the "Hell - on - Wheels" insignia, Capt. Burt, 28 years old, was highest ranking of 15 men to be awarded the Congressional Medal of Honor in the ceremonies which are shown in the above picture.

Four members of his family were present when this took place—his wife, Frances, from Benevolence, Georgia; his parents and aunt, Mr. and Mrs. J. Fred Burt, and Mrs. Gerald A. Morin, all of South Lee. The women wore purple orchids, gift of the War Department. The blue ribbon of the Congressional Medal was placed around Capt. Burt's neck by President Truman.

Now Capt. Burt goes back to South Lee, just plain Mr. Burt as far as his position in the ten-tons-a-day mill is concerned, helping with the others to make first class writing, photographic, saturating, filter and mould-made papers. E. A. Sitzer is president of this company. Mr. Burt will work again in the technical department where Jessie E. Minor is chief chemist.

Southern Kraft Acquires Timber In Louisiana and Mississippi

Acquisition of 235,000 acres of forest stand held by the Denkmann Lumber Co., Canton, Miss., in Louisiana and Mississippi has been effected by the International Paper Co. in a $4,500,000 transaction. The timber was transferred in two 99-year contracts, one for each state, with privilege of buying the land for an additional $3.50 per acre.

The Southern Kraft Division of International has an alternate privilege of lump price or payment on timber stand volume determined by a cruise.

Denkmann Lumber Co. was represented in the transfer by John H. Hauberg, its president. International Paper Co. acted through Major J. H. Friend, vice president in charge of Southern Kraft Division, who signed as president of Southern Kraft Timberland Corp., a Georgia subsidiary chartered Sept. 14, 1944, in Fulton County, Georgia, with H. S. Galloway, of Mobile, Alabama (assistant secretary and assistant treasurer of International Paper), James N. Frazer and James K. Rankin, both of Atlanta, Georgia, as applicants.

DENNIS E. COUSINS, Mill Mgr., Hollingsworth & Whitney Co., Mobile, Ala., in new picture taken only few weeks ago. Reason enough for that smile is that his son, Corporal Theodore Cousins, of American 3rd Army in Germany, was home on 45-day furlough. Another son, 2nd Lieut. Richard Cousins, is with 10th Air Force in China.

One daughter Joan, 20, is employed at Washington, D. C., Airport reservations desk of Eastern Air Lines, and other daughter, Barbara Jean, 16, is senior at Visitation Academy, Mobile. Barbara Jean was born in Tacoma, Wash., when Mr. Cousins managed kraft mill there.

Mississippi Stands

The Mississippi transaction includes 51,919 acres in Rankin County, 61,037 in Leake, 15,352 in Madison, 12 281 in Scott, and 160 acres in Neshoba County, a total of 140,-749 acres.

Upon effectuation of the contract, Southern Kraft received title to trees of all species and sizes, whether standing or down, and all other forest products. together with any future growth during a 99-year period. However, a cutting limitation applies during a period within ten years of termination of contract.

Southern Kraft is to have full access, with right to build tramroads, fire breaks, roads, sawmills, or any other structures for operation in connection with the timber. Such improvements may be removed within 90 days of termination of the agreement.

Mineral rights are reserved by Denkmann Lumber Co., with privilege of access and construction of facilities, but with adiustment provided for timber felled.

Rights of action against trespass, and other similar protection rights, are vested in Southern Kraft.

Southern Kraft is to pay taxes on the land (standing trees are exempt from ad valorum taxes in Mississippi), except that increases due to mineral values held by Denkmann Lumber Co. shall be paid by that company.

On or before March 1, 1946, Southern Kraft may purchase all of the land at $3.50 per acre, to be paid in cash when the deed is signed or any time between January 1, 1986, and December 31, 1995, to purchase all lands that have not been released back to Denkmann at a price to be fixed by three arbitrators, one named by each principal and the third selected by these two so named. If the two arbitrators cannot agree on the third, then he is to be named by a Mississippi district federal judge.

At its own discretion, Southern Kraft may release forest land back to Denkmann and be relieved of paying taxes on such areas up to and including November 30, 1947,

REX W. HOVEY, promoted from Vice Pres. in charge of Manuf'g, to Executive Vice President of Oxford Paper Co., effective Dec. 31 upon retirement of Charles A. Gordon.

Mr. Gordon conttinues as a Director and member of Executive Committee, but ends 27 years of active service, according to announcement by President Hugh J. Chisholm. Mr. Hovey, who headed Paper Division of WPB during perhaps its most critical period, has been 20 years with Oxford, starting as Gen. Mgr. of the Nashwaak Pulp & Paper Co., and as Tech. Director in New York before becoming Vice Pres. in 1932.

provided that not less than 640 acres in a contiguous tract may be turned back, except in the case of outlying tracts having a smaller acreage. It may not release lands between Dec. 1, 1947, and Nov. 30, 1957. Release may be effected after that date. Release may be executed only once annually.

Land used exclusively by Denkman in connection with mineral rights operation are to be released and taxes paid by the owner.

The 250-acre hardwood mill site and other Denkmann properties in Canton, Miss., and a 218 acre logging camp near Carthage, Miss., are not included in the transaction.

Southern Kraft had the right to start cutting in the stands immediately upon effectuation of the contract. Denkmann has the right to continue cutting saw logs for the Canton mill until sixty days after March 1, 1946.

Southern Kraft shall at all times be governed by good forestry prac-

tice and within ten years of the release of any land, in accordance with the release provisions hereof, or within ten years of the date of the termination of the contract, shall not cut any timber measuring four inches in diameter or less breast high from the ground, unless such cutting be necessary for (a) thinning in accordance with good forestry practice and (b) clearing for roads, camp sites or other surface purposes contemplated hereby.

Louisiana Stands

The contract covering approximately 95,000 acres of forest stand in East Baton Rouge, East Feliciana, Livingston, St. Helena, and Tangipahoa parishes in Louisiana, according to W. H. Giles, vice president of Denkmann, was identical in respect to terms and conditions to the Mississippi agreement. The Louisiana contract was filed about two weeks subsequent to the Mississippi agreement.

Authorization for the disposition of its forest and forest lands to International or its subsidiary was effected by Denkmann directors on Sept. 26. Denkmann plans to continue in business.

Cotton Linters Displacing Rags in Paper Manufacture

Rags may be displaced entirely in the manufacture of high grade rag content papers if the development of cotton linters for use in the manufacture of paper continues the pace it has maintained to date. That was an opinion in which a number of speakers generally agreed at the late November meeting of the New England section of TAPPI at Holyoke, Mass.

Lloyd Kitchel, director and general manager of the Virginia Cellulose division of the Hercules Powder Co. of Wilmington, Del., described the development from the raw cotton that has taken place in the past few years, and made a comparison of its qualities from the viewpoint of cleanliness, color, strength and adaptability.

Capt. John Burt of the Hurlburt Paper Co. of South Lee, a Congressional Medal of Honor winner, who recently returned to his position at the mill laboratory, was present and was tendered an ovation.

Nichols Handles Industry Affairs in State Dept.

The "key" man in the U. S. State Department for the pulp and paper industry is now Clarence Nichols, assistant in the Commodities Division under Donald D. Kennedy, chief of the Division.

Mr. Nichols now has jurisdiction over pulp and paper foreign trade, formerly directed by John W. Fuchs, who resigned from the State Department last month to return to American Express Co. as a trade specialist. Mr. Fuchs, however, is continuing to act as a consultant to the department.

WHEN G. W. E. NICHOLSON left Union Bag and Paper Corp.'s Savannah, where he had been Resident Engineer, to assume his new position of Vice Pres. in Charge of Manufacturing, with offices in Woolworth Bldg., New York City, he received a number of fine gifts from various groups in the mill. Here he holds two silver candelabra presented to him by the Supervisors at their quarterly dinner meeting in the Hotel De Soto, Savannah.

Left to right, the others are: T. T. DUNN, who is the new Resident Manager at Savannah; Mrs. NICHOLSON; KIRK SUTLIVE, Public Relations Mgr., and Mrs. Dunn.

TEXAS ENDS WAR WITH MORE TIMBER THAN AT START

Despite four years of heavy cutting to meet war demands, East Texas forests at the beginning of 1945 showed more timber volume than in 1938, according to W. E. White, director of Texas A. & M. College forest service.

He said that he based his statement on statistics of the U. S. Southern Forest Experiment Station.

Standing timber volume in pine and hardwood trees of sawlog size at the beginning of 1945 stood at 29.3 billion bd. ft., a gain of 100 million bd. ft. over 1938.

"The remarkable growth of East Texas timber, fire protection and improved forestry practices helped to account for the fact that we ended the war with an increase in timber volume rather than a deficit," Mr. White said.

Total production of wood products last year amounted to slightly more than one and a half billion bd. ft., as compared to a net timber growth of 1.8 billion bd. ft. The gain in new growth over the cut amounted to 283 million feet in 1944. White said that the timber report was based on 36 East Texas counties, covering 10,552,000 acres of forest land.

Although overall East Texas lumber condition was reported as "very favorable," 19 northeast counties showed a greater timber cut than growth.

K. O. Elderkin and Son Have Reunion

K. O. Elderkin, paper mill manager, Crossett Industries, Crossett, Ark., had his son, Pvt. Lea Elderkin, U. S. Army, home for a visit recently. Young Elderkin was an engineering student when called into service. His father was for years identified with the industry in Newfoundland and Quebec.

Harold Macklem Visits Family in Hamilton

Harold Macklem, plant engineer, Florida Pulp & Paper Co., Pensacola, Fla., went home to Hamilton, Ohio, for a rest and vacation during late October and November. His father is W. W. Macklem, sales engineer for the Black-Clawson Co., in Hamilton.

Childersburg, Alabama, Considered As Mill Site

A group studying potential postwar uses of the Ordnance Works at Childersburg, Alabama—including possibility of turning it into a paper mill—has made a "thorough examination" of facilities, says Executive Secretary Hugh McElderry of the Talladega (Ala.) Chamber of Commerce.

C. B. Short, chairman of the newsprint mill committee of the Southern Newspaper Publishers Assn., toured the ordnance plant. Childersburg is one of four or five favored sites for a newsprint mill in the South, others being near Beaumont, Tex., Valdostia, Ga., southwest Mississippi and in Arkansas.

Lawrence Cousins Drives To Maine From Hodge, La.

Lawrence Cousins, of the Southern Advance Bag & Paper Co., Hodge, La., took advantage of the end of gas rationing to drive to his family home in Howland, Maine. He is a brother of Dennis Cousins, manager of the H. & W. mill at Mobile, Ala.

SLICK PAPER AND NEWSPAPER PUBLISHERS COMPETE FOR SUPPLY

Many newspapers get notices of reduction. Time buys Hennepin Paper Co. Curtis Publishing Co. announces it will get 10,000 tons annually from West Linn. More than 30 new magazines are announced. Book business booms.

The feverish hunt of the magazine publishing industry for paper supply continued during the past month.

Titles of more than 30 new magazines have been announced in little more than a month.

Time Buys Another

The Hennepin Paper Co., Little Falls, Minn., has been purchased by Time, Inc. This is the third mill bought outright by the publishers of Time, Life, Fortune and Architectural Forum, the others being Bryant Paper Co. in Michigan and Maine Seaboard Co. in Maine.

Hennepin has a 111-inch trim Fourdrinier on which it has been making corrugating and specialties with 50 tons daily capacity. It also produces 40 tons daily of groundwood.

St. Regis Paper Company, supplier to Time, Inc., acquired Watab Paper Company, 30 miles from Hennepin, and will manage both mills, as well as Maine Seaboard. Roy Ferguson, St. Regis president, said Lyman Beeman becomes a vice president in charge of operations at Watab, where Tom Mark remains as manager. Jesse Trask continues as manager at Hennepin.

Meanwhile, gloom spread in the newspaper world. Some mills were forced to reduce supplies to newspapers.

High costs and low prices have made newsprint manufacturing so unproitable that a continued decline of U. S. production in 1946 is expected. Meanwhile, increased production of Canadian newsprint is likely to take place so slowly that some newspaper groups are urging a continuation in 1946 of distribution controls in both U. S. and Canada.

It became "official" that the new coated book paper production of the Crown Zellerbach mill at West Linn, Ore., would be shared with Time, Inc., by its principal rival for paper supply, the Saturday Evening Post.

Walter D. Fuller, president of Curtis Publishing Co., told a National Association of Manufacturers' meeting in Portland, Ore., that his company would receive 10,000 tons annually of the "slick" paper from West Linn and that most of this would go into The Post.

Time-Life officials expect to supply 1,000,000 Western readers with paper supplied at West Linn and in editions of those magazines printed in California.

Mill Expansion Under Way

Fountain piers and foundations were already under construction at West Linn for the new building to house a battery of supercalenders and other finishing equipment, but most of the construction there was not expected to get under way until early 1946.

Expansion program of the Consolidated Water Power & Paper Co., Kimberly-Clark Corp., New York-Penn. Co., Bryant Paper Co., St. Regis and others in the coated book paper field were being pushed as rapidly as possible.

Work at the Quinnesec mill of Kimberly-Clark at Niagara, Wis., where facilities were being added for two new machines—like work at West Linn—was not to be completed until 1947.

The Consolidated program at its Biron mill, where one machine is being added, was due to be completed in about October, 1946. The work at its new Wisconsin River division, where two news machines are being converted to magazine paper, was scheduled for completion in the spring of 1946.

A modern power plant replacing much outmoded equipment is going in at Bryant Paper Co., now a subsidiary of Time, Inc., in Kalamazoo, Mich., and this will permit increase of coating and other improvements there.

Plans of Magazines

Optimists in the magazine field say the war has developed 20,000,000 new readers for slick paper publications. The pessimists predict that when competition gets keen, there will be plenty of dead and dying magazines strewn over the eastern publishing centers.

Life magazine, however, has assured its advertisers that it will have 4,500,000 readers in April; 5,000,000 next October. Curtis Publishing Co. foresees 5,000,000 for The Post next year.

Curtis has announced a new magazine to be entitled Holiday, on travel and recreation in Post-style and starting with a guaranteed 300,000 circulation. It is no secret that Time-Life are also planning a new magazine. And Crowell-Collier is looking at a dummy for a pictorial weekly. Saturday Review of Lit-

INDUSTRY FACES SERIOUS DEMAND PROBLEM IN '46

While paper output has increased about 10% since termination of War Production Board restrictions, it is doubtful that the industry will be able to meet an anticipated 15% increase in consuming industry demands during the early part of 1946, even though new production records are indicated, M. C. Dobrow, executive secretary of the Writing Paper Manufacturers Association, said in an interview.

"We ended the war with the pipe lines pretty empty," Mr. Dobrow explained, "with no inventory at the mills, and with subnormal inventories in the hands of merchants and consumers and more or less scarcity conditions in paper markets generally. If substantial increases in shipments to civilian markets in October and November could be maintained steadily until next summer, it is probable that the pipe lines would be replenished to normal levels and the industry would return to normal supply-demand conditions."

But, he added, there are three reasons indicating the demand may not be met:

1—There is serious doubt of a pulp supply in the first half of next year sufficiently adequate to maintain such a high level of production. From information now available it appears that fine paper demand will be up about 15% from the level of consumption of the third 1945 quarter. There is not enough pulp in sight to maintain a 15% increase during the first six months of 1946.

2—The expected squeeze by periodicals on the total white paper supply. It seems probable that the periodicals will go from a consumption of about 750,000 tons to 1,000,000 tons.

3—Reconversion needs, expected to bring about much larger demands for business and printing papers.

"The over-all outlook for 1946," Mr. Dobrow concluded, "clearly is one of high volume and, in all probability, a record production."

erature, Marshall Field-backed, also is planning a mass circulation weekly. And Gentlemen's Digest and a host of pocket-size digest magazines are in the hopper.

Crowell-Collier is spending a million dollars to expand one of its printing plants. McCall's and the Redbook are spending $7,000,000 for printing equipment. The Conde Nast group is also expanding facilities. Of course, the amount of money being spent by the "Big Two"—Time, Inc., and Curtis—is way up in seven and eight figures, including the purchases of, or investments in, paper mills.

A lot of new ideas are being discussed by magazine production executives and paper company executives for possible changes in papermaking and publishing methods. The Time, Inc., officials, particularly, are demonstrating constantly in their contacts with the paper companies that they are not going to be bound by conventions. Anything can happen these days in this field.

Book Publishing Boom

Things are booming, too, in the book publishing field. Paper is no longer the chief problem—but printing and binding remain difficult. Books that sell 100,000 copies are the ones that get most attention. But even more important, say the publishers, are books which sold hardly more than 5,000 copies each in the years 1930-1940, but today will go to 20,000-50,000.

Newsprint Boost to $66?

In some informed Canadian circles it is believed certain that the newsprint price will be increased $5 a ton on Jan. 1 to a new price of $66 a ton. This may tend to slow up the shift in mill operations from newsprint to other types of paper. It is the only thing that can do so.

Several mills have reported that they have made little profit in newsprint and in some months have shown a definite loss. Mills probably would not be going off newsprint if it would yield a reasonable profit over a long term.

On the other hand, magazine publishers and other users are reported to be showing a disposition to cooperate with mills in order to protect the source of supply for the future. Certain mills have informed PULP & PAPER INDUSTRY that this is another reason why they are not interested in newsprint making. The newspapers cannot point to any record of theirs as having shown any concern over protecting or defending the North American pulp and paper industry.

ROBERT L. FITTS, recently elected president of Paper Bag Institute, Inc., in New York City. Mr. Fitts, president of the Southern Advance Bag and Paper Co. (mill at Hodge, La.) was a member of the War Production Board Pulp Allocation Committee during the war. In his new position as president of the Paper Bag Institute he represents an industry which in normal times does approximately ninety million dollars worth of business, and consumes more than 600,000 tons of kraft paper annually in the production of grocers and variety bags.

Minnesota & Ontario Paper Co. expects to run newsprint in its Canadian mills at about 82% of capacity in 1946 and at the end of that year, it has announced, it will begin to increase its other types of paper. These will include coated papers.

Donnacona Paper Co. is one of the first of the Canadian mills expecting to increase production of newsprint, boosting its capacity from 275 to 300 tons daily in January. The St. Lawrence Co. plans to increase its output in the second half of 1946. Powell River Co., in the west, reports some easing already of its labor situation, permitting some increase.

Although the American Newspaper Publishers Association's special newsprint committee has voted in favor of terminating all distribution controls on Dec. 31, there have been many dissenters to this opinion. The Hearst Newspapers, through Gene Robb, protested this proposal, saying too many newspapers would be hurt in the scramble for paper.

Ending government control would not end rationing, he said, as it would have to be carried on by the newsprint mills, with each mill's good or bad luck in getting logs or labor being the determining factor.

Although Canada has decided to discontinue controls over allocation of newsprint after this year, some U. S. publishers are showing anxiety over the supply position in 1946 and in some quarters have suggested that operation of the so-called Canadian (tonnage) pool should not be terminated.

Unless the decision is changed between now and the end of the year, however, Canadian newsprint mills will make their own marketing arrangements as they did before the arbitrary allocation of tonnage was made effective some two years ago. The only exception is with respect to the Canadian market, where the supply of newsprint to consumers will continue to be under control.

Actually in Canada the newsprint industry has been regulated by two pools, one of them a purely financial one which takes care of the distribution of payments to mills on a percentage basis, compensating various mills which for some reason or another might be unable to maintain regular production. The other pool—and this is the pool which affects American consumers directly—is that which applies to distribution and allocation of tonnage.

Forecast of Canadian Newsprint

(By Newsprint Assn. of Canada)

During the first six months of 1946 Canadian newsprint mills are expected to have the following tonnage available as compared with the similar 1945 period:

	Jan.-Jun. 1946 tons	Jan.-Jun. 1945 tons
United States	1,500,000	1,206,163
Canada	105,000	107,144
Overseas	243,000	190,055
	1,848,000	1,503,362

The estimate of United States production of newsprint is 335,000 tons, compared with 353,949 tons in 1945 and of Newfoundland production 100,000 tons, compared with 48,843 tons in 1945. These figures are for the first six months of 1946.

In view of the critical newsprint supply situation on the Pacific Coast the California Newsprint Publishers Association has conducted a telegraphic poll of its members on the subject of newsprint controls with the result that of 72 newspapers heard from, 59 favored continuance of U. S. and Canadian controls.

Above: Night view of Spruce Falls Power & Paper Co., which supplies pulp for new K-C creped wadding mill. Left: ERNST MAHLER, Exec. Vice Pres. of Kimberly-Clark Corp., Neenah, Wis.; Vice Pres. of K-C Corp. of Canada and Vice Pres. of Spruce Falls Power & Paper Co.

NEW CREPED WADDING MILL AT "KAP" IS ENGINEERING TRIUMPH

Kimberly-Clark Corp.'s new creped wadding mill at Kapuskasing, Ontario, is now in operation.

There is no question but that this latest addition to the K-C enterprises is a real "eye-filler"—and is one of the outstanding show-places of this industry today.

All that the K-C engineers and technicians have learned in the Badger-Globe unit in Neenah, Wis., have made it possible for them to advance a good stride beyond even that achievement in this newest similar plant.

A picture accompanying this article shows the window-less building in which the new creped wadding mill is housed. But the interior would have to be shown in color to give anyone who has not been to "Kap" a real picture of what has been created there.

Glazed yellow tile walls and green pastel-painted machinery provide an inside scene in this plant that is a "knockout"—if ever there was one.

To any visitor, it is very evident that a prime objective in this kind of plant is complete cleanliness and such sanitary conditions as would be associated with a food-processing plant.

The new plant, with a 30-ton capacity, adjoins the property of the quarter-century-old Spruce Falls Power & Paper Co., which is jointly owned by Kimberly-Clark and the New York Times, the latter absorbing the output of newsprint, normally 650 tons daily.

Now the new Kimberly-Clark Corp. of Canada, the company formed to operate the creped wadding plant, has become a new neighbor in this busy town in the northern Cochrane territory of Ontario, in the heart of the potentially rich black spruce country. It is interesting to note that before Kimberly-Clark came here, "Kap—450 miles north of Ontario—was listed in gazeteers as having a population of just four persons. Since K-C has brought productive industry and jobs to this territory, even the main air line across Canada has followed the paper company and today "Kap" is one of the principal stopping places for cross-continent air travel. It is also on the northern Ontario route of Canadian National Railways.

Frank J. Sensenbrenner, retired K-C chairman, who was celebrating his 81st birthday on the 23rd of this month (December), started Spruce Falls Power & Paper Co. in collaboration with the late Adolph S. Ochs, publisher of the New York Times.

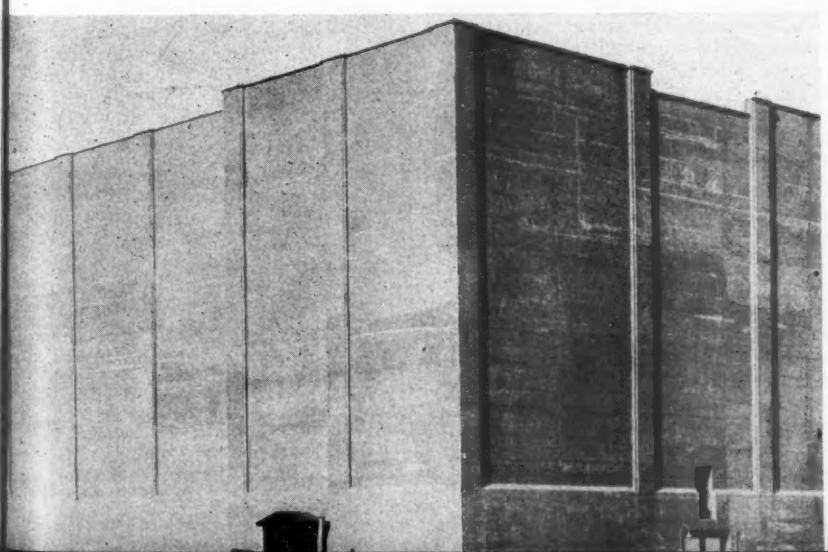
Near-Ultimate in Efficiency

Some 30 tons of slush pulp is the quota directed by pipe line from the Spruce Falls mill to the new creped wadding plant. In the past Spruce Falls has been listed as producing 440 tons of groundwood and 250 tons of sulfite pulp. Surplus of sulfite and other output not used for newsprint is disposed of by Kimberly-Clark.

Coincident with the development of the creped wadding plant, a beautiful job of stepping up the sulfite

Some of Key Men at Kimberly-Clark's new crepe wadding mill at Kapuskasing, Ont. (left to right): CY FARMER, Accountant & Office Mgr.; JOHN TRUSCOTT, Asst. Production Supt.; JOHN HUPPLER, Production Supt., and W. F. COOK, formerly of parent organization, now Mill Mgr.

Interior view of Kapuskasing mill where high quality pulp from nearby Spruce Falls mill is converted. Note lighting for window-less plant. Exterior view below.



Here is an exterior view of the new window-less creped wadding mill completed and now in operation at Kapuskasing, Ont. It is latest of the KIMBERLY-CLARK CORP. mills. Cleanliness, so important in this type of mill, and other advantages result from having window-less plant.

production has been achieved at Spruce Falls, at low cost, and without installation of a single additional digester or other capacity-providing installations.

This has been accomplished by application of the Kimberly-Clark's own process of chip distribution, by forced circulation and by what the K-C technicians call independent acid recovery, as well as by other refinements of the sulfite pulping process developed by the Kimberly-Clark staff.

In preparing for increased output of sulfite for the creped wadding plant, and also for other purposes, Kimberly-Clark has literally chased BTU's all over the place, in heat exchangers on the waste liquor from blowpits, condensers on vomit stacks and in other ingenious ways. A substantial increase of sulfite pulp is accomplished with digesters which in many other places would be listed as having capacity of substantially less than they have in practice at Spruce Falls.

The new mill is equipped to bleach and chemically treat pulp and to produce creped wadding in a continuing process. The trend toward continuous, instead of batch operations, which is becoming so dominant in the pulp and paper industry, is here exemplified in a highly efficient plant.

The Spruce Falls mill bleaching and chemical treating equipment have been supplied by Waterous Ltd., Brantford, Ont., according to designs drawn up by Pulp Bleaching Co., of Seattle, in cooperation with the Kimberly-Clark staff.

One creped wadding machine is now in operation. Eventually the machine room will house two of these machines. The machine and some other principal new equipment have been built by Dominion Engineering Co., of Montreal, in accordance with specifications drawn up by the Kimberly-Clark engineers.

The plant construction job was carried out by Hill-Clark-Francis of New Liskeard, Ont., and Provincial Engineering Co., of Niagara Falls, Ont., as the major contractors. An original estimate of cost of the creped wadding plant was $925,000.

Conversion of the product (Kleenex) is being performed by the Canadian Cellucotton Products Co., at Niagara Falls, Ont.

The construction program was largely under the supervision of J. T. Whelan, assistant chief engineer of the parent company—Kimberly-Clark Corp. He was assisted by a staff headed by Dave Emerson.

W. H. Swanson, superintendent

COLA G. PARKER, President of Kimberly-Clark Corp. of Canada, Ltd., a company formed for the new creped wadding mill. He is also president of the Wisconsin parent company.

of the corporation's pulp manufacturing, and Forrest Werling of the headquarters operating organization, assisted by Horace DuBois, Rudolph Moravek and other members of the engineering and operating staff, also figured prominently in the development.

Among members of the affiliated Spruce Falls Power & Paper Co., who contributed to the program were Fred Laughlin of the purchasing department; B. J. Donovan, traffic manager; Bill Kay, Ed Morley, Jack Barrett, Joe Downey and Hector Desjardin of the engineering and maintenance departments; Gordon Rowlandson of the sulfite department.

In order to insure adherance to high standards of production at KAP, the Kapuskasing branch of the company's operations, a nucleus of experienced operating men was transferred from the parent company. John Huppler, for instance, is the production superintendent at KAP and he is assisted by John Truscott. Some of the key members of the operating staff are Bill Boyd, Harper McClintock, Harold Hansen, Duane Ferguson, Charles Kilishek and William Jorgenson.

The program was originally announced and carried out under the plans authorized by Cola G. Parker, president of the Kimberly-Clark Corporation of Canada, Ltd., as well as of the United States parent company. E. S. Noble is vice president of the KAP subsidiary; W. F. Cook, formerly of the parent organization, is mill manager, and C. C. Farmer is accountant and office manager.

Description of Building

All exterior walls of the new building are of solid reinforced concrete. Due to extreme low outside temperatures and high humidity in the machine room the building was made window-less with all glass omitted to prevent excessive condensation.

The heating and ventilation system for this windowless building is arranged to take in enough outside air in the winter time to replace the air exhausted through the machine hood system and the attic process exhaust systems. The two machine room ventilating units draw the pre-heated air from the adjoining train shed and wash it. This air then passes through reheating coils controlled by thermostats in the machine room, to ducts which supply the air along the machine room walls and over the mezzanine floor.

In the summer months controls are provided permitting the machine room ventilating systems to take in 100 percent outside air. Exhaust fans are installed in the attic, drawing from grilles in the ceiling over the dryer section of the machines to remove the hot air at this point.

The first floor is used primarily for housing mechanical equipment —the folder winder air washer, fans and air pumps with broke chest agitator.

The machine room floor, as stated before, will eventually be

W. H. SWANSON, Superintendent of Pulp Manufacturing, Kimberly-Clark Corp., who figured prominently in the new development at Kapuskasing.

occupied by two machines. The mezzanine floor 72x82 feet at the south end of the machine room is used for stock bleaching and washing. The lighting for the machine room is supplied by flush lighting units, serviced from the attic. General illumination for the machine room is calculated at 22 foot candles.

All interior columns in the machine room are eliminated by the use of steel trusses extending from wall to wall. The finished inside face of all walls is lined with ceramic glazed tile from floor to ceiling. The latter consists of a perforated transite acoustical material suspended from the attic floor steel decking while the aisle between the two machines is a non-slip floor brick laid over the concrete slab.

Concentrated Operation

In the past KAP has produced only the pulp for use in the manufacture of crepe wadding, which in turn produces tissue papers and specialties. Instead of manufacturing all the crepe wadding for the Canadian market at Niagara Falls, the whole process will now be concentrated at Kapuskasing, thus effecting a saving in transportation as well as other advantages. The Niagara Falls plant will concentrate on markets outside Canada, although it will continue to obtain some of its pulp supplies from Kapuskasing.

The Spruce Falls organization has a backlog of timber sufficient to maintain production for many years. The holdings of pulpwood extend 50 miles north and south of the mills, and cutting rights in perpetuity are held on 5000 square miles of timber.

Officers of the Kimberly-Clark Corp. of Canada are, besides Mr. Parker and Mr. Noble: Ernst Mahler, vice president; S. F. Shattuck, vice president; C. H. Sage, vice president; J. R. Kimberly, vice president, and George Barber, secretary-treasurer. Spruce Falls is under the presidency of Mr. Sage.

Mr. Mahler is vice president; Mr. Barber, secretary-treasurer, and E. S. Noble, managing director, of this company. F. H. Davis is the Spruce Falls mill manager; C. W. Boast, chief engineer, and J. V. Kinsman, purchasing agent. R. M. Watt is assistant to President Sage and heads the eastern division in New York.

Mr. Parker is president of the parent company in Neenah, Wis. Mr. Mahler is executive vice president; Mr. Sage, Mr. Kimberly, Mr. Shattuck and W. H. Clifford are vice presidents, and Henry Boon

C. H. SAGE, President, Spruce Falls Power & Paper Co., and Vice President, Kimberly-Clark Corp.

ANDREAS CHRISTENSEN, Pulp Mill Superintendent, Spruce Falls Power & Paper Co., Kapuskasing, Ontario, which produces the pulp for the Kapuskasing mill. He came from the Pacific Coast where he formerly was on the staff of the British Columbia Pulp & Paper Co.

is vice president in charge of operations. He and Mr. Clifford were recently elected to these new positions and William Kellett succeeded Mr. Boon as general superintendent.

Fire at Brompton

Operations of Brompton Pulp & Paper Co. at East Angus, Que., were reduced about 50% Nov. 1 due to a fire which destroyed 40,000 cords of pulpwood on the company's property. If pulpwood can be obtained from elsewhere, production may be stepped up slightly in the near future.

Operations at the company's new kraft and liner board mill at Red Rock, Ont., have recently started.

Wood Price Ceilings Removed in West Canada

Removal of ceiling prices on British Columbia logs produced in the coastal district has added appreciably to the costs of pulp and paper companies, and the situation has been aggravated by the fact that most of the markets are controlled with little or no opportunity for raising the prices of the finished product.

As a result of an agitation by loggers, Canada's Timber Controller D. D. Rosenberry recently agreed to remove the ceiling price, and the B. C. Loggers Association submitted a new schedule of prices which member operators will endeavor to enforce. This has been approved by the Timber Control, but legally there is no longer a limit to the price of logs and it remains to be seen how well the new arrangement works out.

Hemock pulp logs, under the new schedule, average about $21 per thousand. The increase from the former ceiling and the new voluntary schedule is $2.50 per thousand on logs with less than 20-inch butt and $3 on logs with 20 or more inches butt.

Anglo-Canadian Adds More Waterous Grinders

Elliott M. Little, general manager of Anglo-Canadian Pulp & Paper Mills, Quebec, advises PULP and PAPER INDUSTRY that the company is planning to install in January another line of Waterous hydraulic magazine grinders with 4500 horsepower motor.

The only new equipment recently installed is a 94" Kamyr sulfite pulp drying machine with Flakt dryer and Hamblet cutter on which it is expected to turn out about 25,000 air dry tons per year of high quality unbleached sulfite.

No Labor Shortage In West Canada

Pulp and paper companies operating in British Columbia are doing their best to increase jobs to the fullest possible extent to lessen the impact of widespread unemployment already apparent on the Canadian west coast.

For the first time in many months the pulp and paper mills are no longer in serious need of more men. Powell River Co., for instance, has a full crew and has been able to put all its battery of seven newsprint machines in operation for the first time in years, whipping up production to about 700 tons a day.

Pulp and Paper Mill Payrolls Go Up; Log and Wire Strikes End, Relieve Tension

IRA MOSHER, President, National Association of Manufacturers—"Never has home front peace been more essential. Quick reconversion and early establishment of high production are the only trustworthy defenses against inflation."

The wage base in the U. S. Pacific Coast pulp and paper industry will be boosted shortly to new all-time high record levels—not only for that region but for the industry everywhere—providing an agreement reached at Portland, Ore., during the week-end of Dec. 8-11 receives the expected approval of the membership of American Federation of Labor Unions.

Only about a week after Pacific Coast AFL fir-hemlock loggers and lumber mill employes were granted a similar increase, thus ending a ten-weeks' strike which drained many log ponds, the negotiating committees of the two AFL pulp and paper mill unions and of the Pacific Coast Association of Pulp & Paper Manufacturers agreed upon a 15% increase for men employes and a 10% increase for women.

It is estimated this will add $5,000,000 to the payrolls for about 14,000 employes in some 33 U. S. mills. The basic pay for men is thus to be booster to $1.05 an hour and to 85½ cents for women. The night shifts differential also is to be increased from 2½ cents to 4 cents.

There was no specific tie-in made between the increase and the roll-back to a 40-hour work-week, but it was assumed generally by the negotiators that the pay boosts would be taking effect about the time, or after, all the mills are back on 40 hours. Nearly all Coast mills expect to be operating on this basis shortly after the first of the year.

The pay increases will go into effect the first of next month after the AFL membership votes and after all necessary steps are taken to make the agreement official. This, it was planned, would require a few weeks and therefore it will be January 1, 1945, when the wage increases go into effect. There will not be any re-opening of the wage question on the basis of the roll-back.

Although wages will be at much higher levels on the Pacific Coast than in other pulp and paper regions, the living costs, according to government figures also are higher than in other regions.

Agreements in Wisconsin

Uniform labor agreement for all Wisconsin and possibly neighbor state mills was still being discussed by executives in that region, the stumbling block being principally that different operations costs and living costs prevailed in different towns.

Meanwhile following upon the increases granted in the Kalamazoo area by about six weeks, two important operations in Wisconsin came to agreement with unions on a scheme for a two-stage increase—a five-cent increase granted now and an additional ten-cent boost beginning Jan. 28-Feb. 4, when 40 hours should be in effect. These effect employes of Consolidated Water Power & Paper Co. mills at Wisconsin Rapids, Biron, Appleton and Stevens Point and Nekoosa-Edwards employes at Port Edwards and Nekoosa. Some Consolidated employes received the 15 cents immediately in cases where they are on 40 hours.

New England Negotiations

Negotiations were proceeding in the Holyoke region on the basis of a 15 cents increase demand by the unions, who rejected an immediate five-cent offer. However, in Maine and New Hampshire, immediate five-cent to ten-cent increases was accepted. Base rates were boosted 65 cents an hour for men. In Holyoke it already was 64 cents.

Union organizations in all parts of the country were keeping each other fully informed on the regional and individual mill raises obtained, as evidenced by their references to these and resort to comparisons in their arguments.

Wire and Log Strikes

Meanwhile, the paper industry breathed a big sigh of relief when the nearly five 4½ weeks' long wire weavers' strike ended Nov. 19. Inventories of wire cloth in the hands of mills were very low and were poorly distributed. Before the strike ended, Middle West mills were in a precarious position and many mills over the country had only wires ahead for about through 1945. An 8% pay boost and a more liberal apprentice system were among points of settlement.

The Pacific Coast log-lumber strike in the fir-hemlock belt, although over, is forcing some pulp mills to take—or plan to take this winter—long holidays or shutdowns. Their log inventories were dangerously low and if bad weather should now interrupt logging—as it has done sometimes in the past winters—the mills will really be in a jam.

AFL loggers in the fir-hemlock belt were going back to work with a reported 15-cent wage increase for many of them, making their base pay $1.05 an hour, but some questions were still clouding the situation and it may be that a 15%, instead of 15-cent boost, may be the ultimate decision to conform with labor agreements elsewhere.

As it is, the CIO's 40,000 lumber workers and loggers, many of whom took 12½ cents boost, while AFL's 60,000 were on strike, now want the other 2½ cents. The AFL unions in the pine belt—about half of them—were not able to get the 15 cents and were still on strike, refusing 12½. The pine belt strike, however, was not affecting the pulp mills as greatly as had the fir-hemlock region strike.

AFL unions in logging-lumbering had demanded a 20-cent increase. The pulp-paper mill unions had asked 20% and when the mills and unions put the issue up to the War Labor Board, it had been rejected by the government body, which intimated it would only approve an increase tied to the 40-hour rollback.

Mills Hit By Strike

Fir-Tex Insulating Board Co. was picketed and forced to shut down throughout the log-lumber strike.

St. Regis Paper Co. in Tacoma ran completely out of logs. Producing highly important kraft pulp, still in demand for armed forces and also needed to meet an important health demand for grocery bags, this mill kept its machines rolling until there wasn't a piece of wood left except the boom sticks.

It takes weeks for far western mills to build up log inventories sufficient for operation and some other mills may have to take time out to do this.

Even the rebuilding of the Oregon Pulp & Paper Co. woodroom, digester and fuel storage buildings, damaged by fire last August, was delayed by strike-bound lumber and will not be completed until about Jan. 1, returning employment rolls from 300 to 550.

J. D. Zellerbach Describes Paris Labor Meeting, And Suggests Some Things Management Can Do

H. W. PRENTIS, Jr., President, Armstrong Cork Co.—"Instead of talking about purchasing power, jobs and production, we should talk about production, jobs and purchasing power."

Elected a member of the governing body of the International Labor Organization at its conference in Paris in October, J. D. Zellerbach, president of the Crown Zellerbach Corp., San Francisco, is back at his desk, most optimistic about the future of the ILO and about the accomplishments of the meeting.

Mr. Zellerbach, who went to the conference as the United States delegate representing employers, was chosen to be one of the governing body of the ILO for the next three years. On the governing body, representing all the 44 member nations, are 16 government representatives, including seven other employer representatives, and eight labor representatives.

"One of the major accomplishments of the conference," Mr. Zellerbach told PULP & PAPER INDUSTRY, "is that it disassociated itself from the League of Nations, and with other changes, it is all ready to fit itself into the United Nations set-up. A committee has been formed to carry on negotiations to bring about this affiliation.

"Another accomplishment was that recommendations were made to the various governments covering standards of work of children and young people in non-industrial pursuits. Recommendations were also made with regard to health control standards, and minimum standards for labor in department territories, such as Africa.

"Finally a comprehensive set of recommendations to governments regarding employment during the transition from war to peace were made. It had been impossible to work these out during the war, so naturally there was an immense amount of work to be done during the conference."

Asked whether or not he felt that the ILO had proven to be a success, Mr. Zellerbach stated emphatically that he did. "The ILO is stronger than ever before," said he, "and much more vigorous than when it was organized in 1920. The International Maritime Conference to be held in Seattle is an off-shoot of the work of the ILO, as are the conferences on labor conditions in the coal, steel and textile industries of the world."

Comments on Labor Matters

In reply to the question: "Are we going to devise more 'civilized' ways of settling labor disputes?" Mr. Zellerbach replied that it was the hope of every responsible leader in labor and management that such would be the case, but all must put their minds to this, and it will require more give and take on both sides.

"Management," said Mr. Zellerbach, "must run its operations and endeavor to avoid friction with labor, and this does not mean at all that management should be soft, but it does mean management should be fair."

"For example, Sweden appears to be away ahead of the United States, and for that matter, the rest of the world, in settling its labor difficulties. However, here on the Pacific Coast, the pulp and paper industry has set a fine example of the way labor relations should be handled in a fair and amicable manner.

What should management do to keep up with smart labor leadership? "The answer is obvious," stated Mr. Zellerbach, "Management must devote just as much thought and time to the problems of labor relations, as do the labor organizations."

In conclusion, Mr. Zellerbach said that the ILO conference was concerned with the broader aspects of social and economic problems of labor throughout the world, and in most of these respects the United States was ahead of all other countries.

The interest of the United States in the ILO is twofold—as the leading industrial nation it is part of our responsibility to give leadership in developing plans to assist other nations to obtain higher living standards. We also have a selfish reason for, from our own viewpoint, anything that improves the condition of labor in any part of the world helps us, he said. More spending power in other parts of the globe, means more payrolls in the United States.

By helping to improve living conditions in some far-off land, we help to take away dissatisfactions, and get those people out of the "have not" psychology, thus such economic and social welfare could help alleviate the cause for wars, said Mr. Zellerbach.

He had hoped to get to Sweden to meet some of the leaders in the Scandinavian countries, but because of the limited time that he had at his disposal, he was forced to give up the idea.

"The French paper industry is still paralyzed on account of the lack of pulp," commented Mr. Zellerbach. "While there is now transportation available from the Scandinavian countries, there is not sufficient fuel available there for the production of pulp at full capacity."

H. D. MARTINDALE, Vice President & General Manager, Shartle Brothers Division, Black-Clawson Co., who is one of the machinery industry leaders giving of their time to help the OPA over the difficult war-peace transition period.

Serving on OPA Industry Advisory Board, Mr. Martindale's 45 years in industry in varying conditions of prosperity and his previous service on NRA and on WLB Advisory Board are guides to his counsel. The big problem in machinery is the 1945 costs in comparison with 1942 ceilings. OPA may help or hinder equitable flow of materials to paper machinery builders.

Max Oberdorfer Now Asst. Manager

Max Oberdorfer, Jr., recently returned from two years and one half of service as a First Lieutenant, Army Transportation Corps, with station at Seattle, Wash., and before that for three years plant engineer of St. Helens Pulp & Paper Co., St. Helens, Ore., has been named assistant general manager of this company.

A Way to Improve Labor Relations—Build Up Employes' "Sense of Role"

R. W. PRENTISS, Jr., President, Armstrong Cork Co.—"The fact needs to be emphasized that the opportunity for a union to function arises only after a successful enterprise has been established."

The problems of management-labor relations are so all-pervading in industry these days, influencing all phases of operations and even reaching into the sanctums of research, that it is not surprising to find the subject discussed at a TAPPI meeting.

That is exactly what happened at the bi-monthly Pacific Coast TAPPI meeting Dec. 4, held at the University of Washington in Seattle. Principal speaker at the evening dinner, held off the campus at the Meany hotel, was Dean L. R. Guthrie of the Graduate School and also professor in the psychology department.

The psychology of management-labor relations might have been a fitting title for his talk, although it had none and was very informal.

"The time is coming when the incentive for work will be recognized as something which is distinct from 'working conditions' and 'wages'," Dean Guthrie told the audience.

LEE HILL, Commander in U. S. Navy until two months ago, but now on inactive duty and back at his former post as Plant Engineer, Everett, Wash., mill, Pulp Div., Weyerhaeuser Tmbr. Co.

Mr. HILL, graduate of Naval Academy, was recalled to duty 5 years ago and served through war with the Torpedo Research Div., Naval Torpedo Station, Newport, R. I.

Born 46 years ago in St. Louis, Mr. HILL was educated in Denver schools, U. of Texas and Annapolis. After retiring from Navy in 1927, he did construction work in west, at Grays Harbor pulp mill and other places before joining Weyerhaeuser in 1935. His wife and two sons returned to Everett with him, but daughter married in east and remained there.

From the psychological point of view, he said, "incentive to work" has nothing to do with those much-discussed issues but rather with the employe's "conception of his role in an industry" . . . a matter which might be said to involve his sense of personal importance, sense of dignity, etc.

In explaining this psychological theory, Dean Guthrie noted how little children "act like what they think they are," although in a single day their "role" might change many times, including "a tiger" or an 'airplane," "a fireman" or "an Indian," etc. But each time, the "role" is acted with the greatest enthusiasm and sincerity.

In the same way, Dean Guthrie said, grown-ups will act out with utmost sincerity the "roles" which they conceive for themselves. Said Dean Guthrie:

"Thus, in the last war, the propaganda of the Wobblies in the logging camps of the west was to convince the man in the woods that he was not a 'high leadman,' a 'tree-topper,' a 'bucker' or a 'faller,' but instead that he was just a 'working stiff' or a 'wage slave.' Very soon, this man ceased to act like a 'bucker' or 'faller' and instead he began acting like a 'working stiff,' which means he ceased trying to do a certain amount of work each day and instead began trying to devise ways to avoid work."

The dean spoke from personal experience, as he had been sent by the U. S. Government in the last war into the woods to make a psychological study of the causes of the work "slow-downs."

He cited an example of a Union Army in the War Between the States which went into battle with a great "morale" build-up—feasting, women lining streets, heaping flowers on them, etc.— and how this same army in battle turned tail and "ran for home." On the other hand, the bedraggled, hungry army of Stonewall Jackson was a successful army, because they acted their "role" and conceived of themselves as real soldiers. In this war, he said, that as soon as a draftee began to call himself a "machine-gunner" or "expert infantryman," he became a better soldier than if he continued to identify himself by his job at home—"clerk," "painter," etc.

In the same way, he suggested, a lot of industries can spend a great deal of money and time providing special facilities or even luxuries for employes, believing they are thus stimulating the "incentive to work," but are missing the point altogether because they do not take into consideration each individual employe's attitude toward his job.

"House organs and publications of industries which use most of their space running pictures of management and flattering the management of the company are likewise missing the point," he said.

He cited the example of Pacific Huts, Inc., a western wartime industry which made a remarkable man-hour production record in building Quonset huts for the military forces. This company, he said, was locally famous for employing even cripples and handicapped men and women and getting a high rate of production out of them because it gave them individually "a role" and "a name" identifying them with their jobs.

"Even our personal names — as Smith, Wainwright, Fletcher (a man who 'fletched' arrows), etc.— are names that identified our forefathers with their work," he said.

"If you see a man who says he 'is working for Standard Oil' you can put it down that that is a bad sign," said the Dean. "But if that man says 'I am a Standard Oil station operator,' then it is a good sign."

"A pulp and paper company or any other industry will do well to 'build up the sense of role' of their employes," he said. "A company should devise means of identifying their employes as a part of the firm."

AMERICAN FEDERATION OF LABOR—"As labor and industry survey what happened to labor and industry in lands where powers were concentrated in central authority, they fear and oppose steps taken to enlarge the dominion of government over lives and fortunes of people."

Agencies Underestimate Pulpwood Stands in U. S., New Survey Indicates

War demands upon our country's supply of pulpwood and sawtimber apparently have had an effect not greater than that which would have resulted from an equal peacetime period of good markets.

This is one of the important tentative conclusions reached by the U. S.-wide forestry appraisal being presently conducted by the American Forestry Association on the basis of a survey of about 30 states. The appraisal is sponsored by private paper, pulp and lumber industries and began last summer.

"It is our belief that regional distribution of production probably has not varied much from what it normally would have been, although we are mindful of the local distortions due to shortages of labor, supplies, and other factors," Capt. John B. Woods, director of the appraisal, told PULP & PAPER INDUSTRY. He added: "Needless to say, there has been heavy overcutting in some spots and normal or less in others.

"It is too early in our survey to undertake quantitative summarizations but it seems safe to say that less cordwood has been used than in normal times. Pulpwood output has been affected by a pressure for lumber and shortage of workers. Centralization of population in industrial centers and more satisfactory farm incomes seem to have reduced reliance upon wood as fuel. Notwithstanding publicity given to such conflagrations as the large 1945 burn in Oregon, fire generally seems to have taken less than its normal toll of merchantable wood. Insects and disease, however, present an increasing threat, more serious than many comprehend.

"There seems to be wide indication that operating difficulties and the tremendous pressure caused by war demands brought about a lessening of good harvesting practices," said Captain Woods.

"It appears that there is probably more wood of all sizes standing today in our forests than past studies would lead us to believe," he continued. "Traditionally, we think of timber inventories and of growth and drain in terms of sawtimber. For some time foresters have contended that the estimates of yearly timber depletion put out by authoritative agencies have been a bit low. We are disposed to agree with this view as regards cutting for industrial consumption, but it is questionable whether the actual yearly drain in fuelwood and on account of fire, insects, disease and storm has been much larger than the year by year estimates. On the other hand, we believe growth of timber in all sizes has been under-estimated in practically all parts of the country. It may be readily seen that even a slight favorable balance extended over a decade would account for some surprises, particularly in cordwood and smaller sizes.

"In terms of sawtimber the inventory picture, while encouraging, is admittedly spotty. In the west the forest is predominantly mature and in places over-ripe. In the east and south, while most of the forest land is covered with young stands, there are, nevertheless, disturbingly large volumes of medium size but low quality hardwoods. There are considerable areas where the much-preferred softwoods are being crowded out by young hardwoods.

"While America's forest inventory is probably gaining ground at this moment, foresters would not agree that the time is yet ripe for entering into a period of sustained production at much above present level. Actually the American forest is a machine idling at half speed; its growth potential tremendous but because of widely prevalent inadequate present stocking it is unable to realize upon it to the full.

Increased Consumption Okayed

"Presumably there will be a considerable increase in consumption of pulpwood and in general it would appear that such a development is possible. Natural regeneration and planting have provided an increasing base for pulpwood production in the Lake and Central States. In the South improved forest practices may keep pace with species deterioration and so provide a continuing supply for southern mills. The picture is difficult to analyze in in the Northeast because, although forest management is understood, the tendency has long been to cut so closely upon much of the land that growth is not fully realized upon. Also there is a threat of insect losses which may be staggering. From the Rocky Mountains westward, there is, of course, a vast storehouse of pulping species. Their utilization is subject to limitations too well known to demand discussion here."

JOSE DE LA MACORRA III, son of the President of San Rafael Paper Co., San Rafael, Mexico, whose operations are designed throughout the modern plant according to a gravity-flow plan. Young SR. De la Macorra graduated from engineering, Univ. of Texas in June and is now spending a few months in study at the Institute of Paper Chemistry, Appleton, Wis.

The forestry appraisal is now winding up field work in 34 states and in April will begin the preparation of the nation-wide report. Although a private undertaking, both routine and special services were forthcoming from governmental sources. Fifteen state foresters made contributions of technical services or cash, or both. In nine states cooperation was furnished by educational institutions. Federal agencies also cooperated.

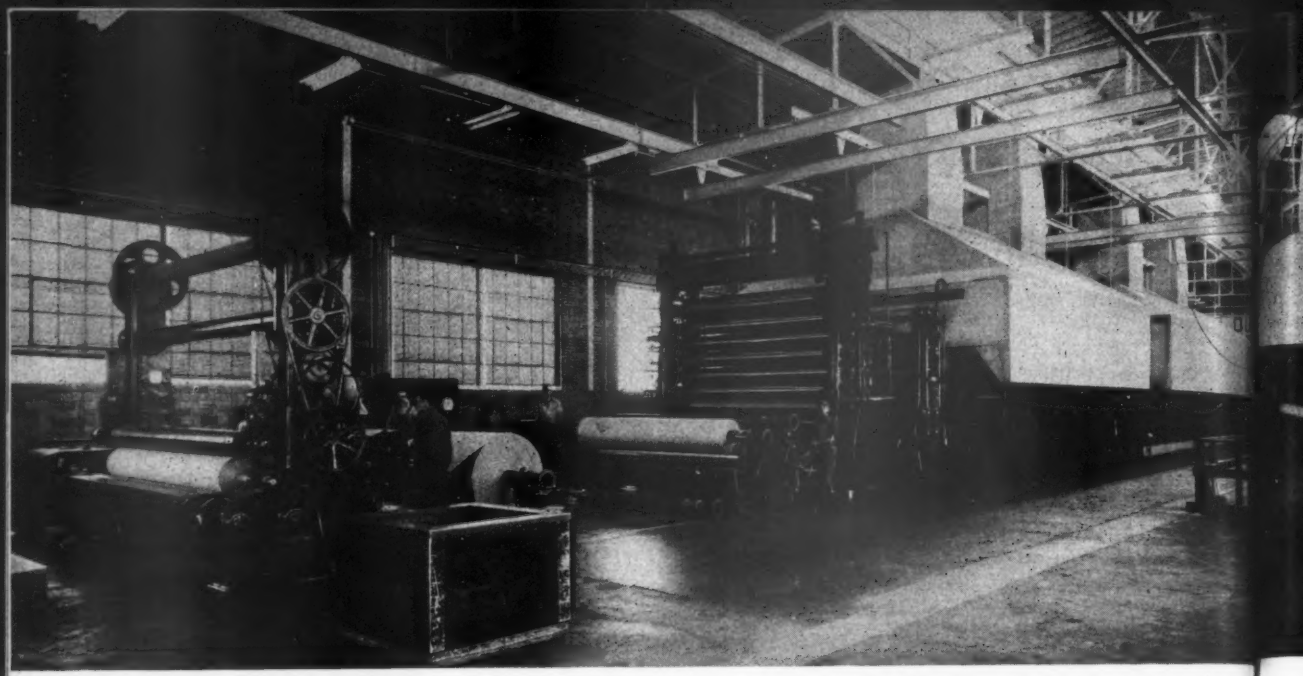
To raise $250,000 to obtain facts about our forest resources more than 500 individuals, associations, and firms contributed sums from $5.00 to $25,000 for the job.

The U. S. Forest Service also has launched its own reappraisal of forest resources.

Evans, Ex-WPB Official Now With Riegel

Robert H. Evans, until recently chief of the now defunct Pulp Allocation Office of the U. S. War Production Board, has accepted a position as executive assistant to the management of the Riegel Paper Corp., New York.

Mr. Evans for some years before that was with the investment department of Fiduciary Trust Co., New York.



DRY END OF No. 9 BELOIT specialty machine at Thilmany Pulp & Paper Co. (trim 120 inches). Note "Quality First" sign beyond hoods. Another part of sign shows in picture on opposite page.

THILMANY PULP AND PAPER COMPANY

Key Men at Kaukauna Find Plenty Of Opportunity for "Original Thinking"

The most successful mills in this industry have distinctive characteristics—usually reflecting the personalities and the talents of the men who created them. It may be said of Thilmany Pulp & Paper Co. that this outstanding member of the kraft family is an "engineering-minded" institution.

Kraft mill men of the Far West and the deep South are products of this mill. At this mill in Kaukauna, one of Wisconsin's most picturesque small towns, just a short way up the Green Bay road from Appleton, these men got into the habits of "original thinking" and attacking all their problems from an engineer's cool and unprejudiced point of view. They are not inhibited by any of the ancient habits of papermakers.

Men like Bob Wertheimer in the West and Erling Riis in the South may call Thilmany their "alma mater." What they and many others learned from the elder Wertheimer when he headed the Wisconsin company is still the line of thinking at Thilmany under direction of Karl E. Stansbury, who is now the president; E. H. Jennings, vice president in charge of sales, and Charles R. Seaborne, vice president in charge of manufacturing.

Mr. Seaborne, who came to Kaukauna 26 years ago as an engineer, and who designed and built the Longview Fibre mill in the Far West, has encouraged originality and ingenuity in his staff.

It is reflected today in the extensive postwar program of improvements, already well under way in this mill.

A PULP & PAPER INDUSTRY editor, recent visitor at Kaukauna, observed many examples of this ingenuity and originality.

Improvements

It is reflected strikingly in the new filtration plant which is near completion this month and is shown in photographs with this article. Thilmany's own engineers teamed up actively with Dorr Co. experts and William Gallagher of the Appleton City Water Department in building this 4,000,000 gallons-per-day plant, with provision for doubling of its capacity whenever desired.

It is reflected in the planning which went into the decision to install an entire new Fourdrinier section on the No. 8 machine (120 in. trim), a Yankee that is a producer of glazed paper. Here a specially designed double breast roll, made by Rice, Barton Corp., is to be installed. A new type Johns Manvills "Chemstone" head box already has been delivered and all the new and definitely original equipment for this machine is expected to be in place and operating some time in January or February.

The nearby No. 9 Beloit machine, 120-inch trim, shown in an accompanying photograph, was installed three years ago—the most recent machine at Thilmany. But it stands as a monument to the originality shown by the Thilmany staff which is sure to be observed by any visitor. The hood of this specialty paper machine was designed and made by Thilmany men. It is built with transite and ventilating fans at top, carrying air through the roof.

Replacing heavy equipment and cutting down power use, a battery of four new Morden Stock Makers will be installed in early spring ahead of No. 9 machine. This is another of many similar developments in mills of this type, which

WET END OF No. 9 at Thilmany's new mill. This view and connecting view on previous page show spick and span appearance of machine room. Art Schmalz, Asst. Gen. Supt., stands at extreme left, with an assistant.

...LOOKS AHEAD WITH IMPROVEMENTS

New Fourdrinier Section, Filter Plant And Morden Stock Makers for Kraft Mill

are turning more and more to continuous pulp preparation.

A comparatively new control laboratory, with air-conditioning, fluorescent-lighting and all the latest equipment, one of the more recent ones in the industry, now stands on the site of the old No. 4 machine.

This mill is dedicated to "quality" production as a big sign, bearing those words, which stands high on the wall in Mill No. 2 machine room, testifies. This equipment in the laboratory provided for Martin Downs, technical director, and his staff, is part of the insurance provided for getting out a quality line of products.

The filtration plant, providing a pure water, as well as all the other improvements now going into this mill, are all aimed to give it products that will reach a less competitive and higher priced market.

No. 8 Machine Changes

Returning to a more detailed description of some of these improvements, it may be said the new double breast roll for No. 8 machine employs a simple engineering fact, and thus achieves the elimination of any sagging of the paper on the machine. It consists of a lower large breast roll, which takes the biggest stress of the wire, and a smaller one above it, which takes less stress. Thus the first table roll can be much closer to the top breast roll than otherwise could be permitted, eliminating any sag.

Smooth and easy to clean is the new compact Chemstone head-box for this machine. Cleaning it out is a simple task because it is compact and has no square edges or pockets. It has wax-treated inside surfaces. What it will achieve principally for Thilmany is to make it possible to run a great deal of colors, permitted by fast washouts. It is made of a material that will not rot or warp.

Filtration Plant

An interesting feature of the new filtration plant is that it is built on solid rock in an island in the Fox River, as are the two Thilmany mills. Incidentally, the recent purchase of the Sangamon Paper Mills from the Cohen family, gives Thilmany a continuous section of the island in the River, connecting the two Thilmany mills. The Sangamon or old Patten mill was gutted by fire and there has been no decision made by the Thilmany company as to what it will do with this property.

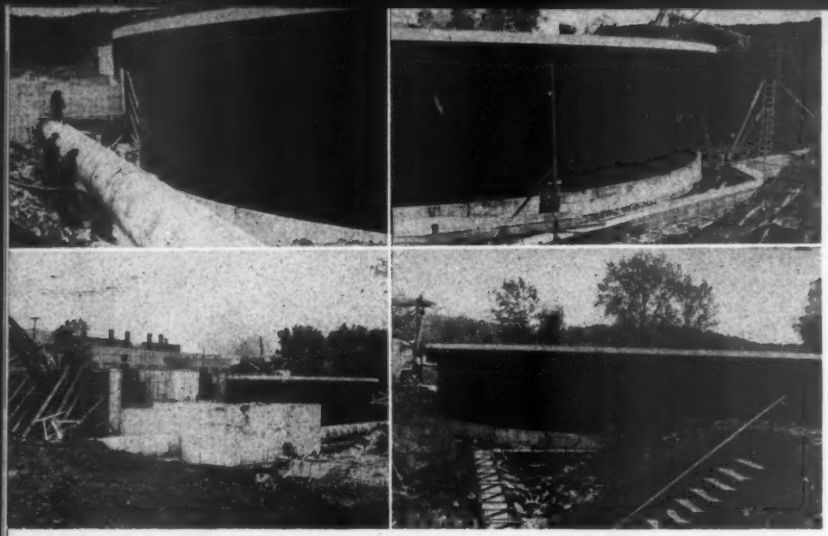
The filtration plant, which will condition water for use in the bleach plant and on the paper machines, will run water from the river through a coarse screen; from there to a flocculator basin, where chemicals will be added; then to a clarifier tank; the sludge will be settled out and removed directly into a sludge pit and pumped back into the river. The clear water off the top of the clarifier will go to a clear well and from there to the mills.

Between the flocculator and the clear well is a dry well, which will house pumps, motors, agitators, etc. The equipment is largely furnished by The Dorr Co.

Heretofore, Thilmany has used water direct from the river.

Women Clean Machines

A visitor at Thilmany sees many ideas being carried out here which might be advantageous in other mills. They make no claims that they are all original, but alto-



VIEW FROM ALL SIDES of the new Filtration Plant now near completion at Thilmany Pulp and Paper Co.

Thilmany's own engineers teamed up with Dorr Co. experts and an Appleton, Wis., water department engineer in laying out this 4,000,000 gals.-per-day plant, built on solid rock. Provision is made for later doubling of capacity if desired.

Equipment is largely furnished by The Dorr Co. Principal divisions of the plant are a screen, flocculator basin, clarifier tank, clear well, sludge pit and dry well, which houses pumps, motors, agitators, etc. The process is described briefly in the accompanying article.

portance with their other duties.

Roll Transport

Just one other example of ingenuity at Thilmany seems worthy of mentioning, although we could go on in this article citing a good many. A Towmotor lift-truck and a little thinking about how to use the machine, has enabled one man to do quite a job in handling and transporting big paper rolls. During the critical labor shortage, this was an important matter.

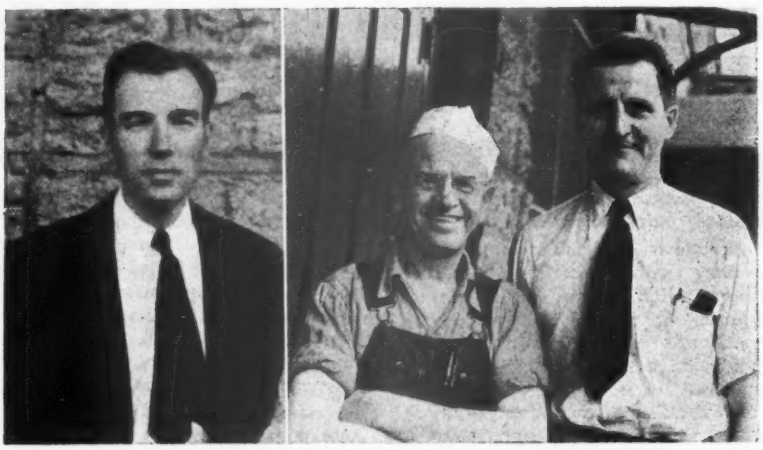
The truck will lift four rolls of butcher paper or two rolls of waterproofing. The lift-truck deposits them directly upon a small auto truck at a siding. By simply snapping a chain over the rolls, they are safely in place. The driver of the lift-truck then drives them from Mill No. 2 to old Mill No. 1 for finishing. Here is a job that it was thought required four or five men, using dollies for conveyors. Now one man does the job and is back for a second load in 15 minutes.

gether these novel ideas are evidence that this is an obviously progressive and alert organization.

A PULP & PAPER INDUSTRY visitor was struck by the spic-and-span cleanliness of the machine rooms. There was very little water on the floors and machines were bright and shining.

We asked about this and discovered that Thilmany has a special clean-up crew of women who go through the two mills from stem to stern every day. There is one woman assigned to each of the large machines, but in the case of the smaller machines, two are handled by a single worker. These women dust and clean up from jordan to winder and that's a job a woman can do best, they say at Thilmany.

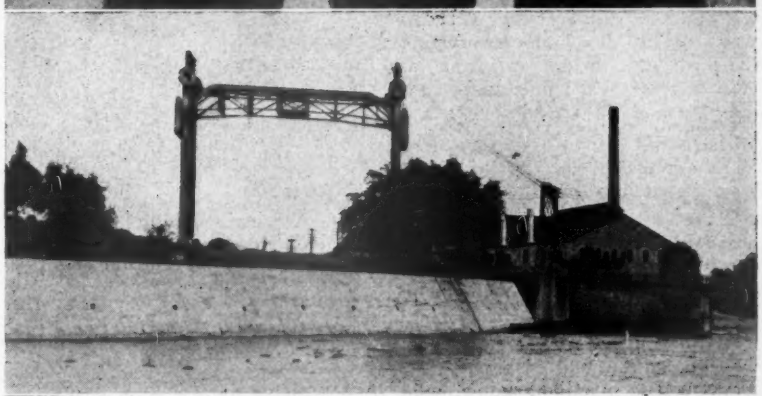
In many mills, this clean-up is part of the work of the regular machine crew and as a result it must take its place in comparative im-



Left to right: MARTIN DOWNS, trans-planted Pennsylvanian who is Technical Director at Thilmany; FRANK SIEBERS, Mill No. 1 Tour Foreman (brother of Tony and Steve Siebers of Longview Fibre Co.), and FRANK X. KREILING, Superintendent of Mill No. 1 at Thilmany and Secretary-Treasurer of Northwestern Superintendents Division.

On left, TOWMOTOR LIFT-TRUCK being ingeniously used at Thilmany Pulp and Paper Co. Truck lifts four rolls of butcher paper or four rolls of waterproofing. It deposits them directly on small auto truck at a mill siding, as in this photograph. By simply snapping chain over rolls, they are then safely in place. They can then be moved quickly to finishing room in another mill. One man does whole job and is back in 15 minutes for second load. On right, the new type Johns Manville Chemstone head box for No. 8 machine at Thilmany Pulp and Paper Co., already delivered and to be in operation soon. Smooth and easy to clean, because it is compact, has no square edges or pockets. It has wax-treated inside surfaces. It makes possible the running of a great deal of colors with fast washouts.

NEW PICTURES taken at Thilmany Pulp & Paper Co. by PULP & PAPER INDUSTRY: Top (left to right):) ART SCHMALZ, General Superintendent; TED SUTHERLAND, Secretary-Treasurer, and CHARLES R. SEABORNE, Vice President in charge of Manufacturing. The old mill is at right in next picture. The new mill is beyond it. Lift-bridge is shown in center. It crosses a canal paralleling the Fox River. Next is view of river bridge leading from lower part of town of Kaukauna to the mill. Below: Courtyard at old mill. At this "Proving Ground", the reinforced waterproof kraft papers made at Thilmany are exposed to all kinds of weather.



Attractive Site

A story about Thilmany is not complete without some mention of the attractive and beautiful landscaping around these mills. Their position on the island and in relation to the Fox River canal, and to the river and power installations, were definitely designed to enhance the general beautiful perspective of Kaukauna. This little town, of about 8,000, has prospered while retaining a beautiful appearance and an air of good living, because of the paper industry in the heart of the town.

Thilmany officers, in addition to Mr. Stansbury, Mr. Jennings and Mr. Seaborne, are Marvin Preston, vice president; E. R. Sutherland, secretary-treasurer, and W. V. Voie, assistant secretary.

Arthur M. Schmalz, who made a trip to the Pacific Coast mills early this year, is Thilmany's general superintendent. He has been at the Kaukauna mill for 40 years, off and one, once broken by a term in the U. S. army which found him stationed at Vancouver Barracks, in the state of Washington.

Martin Downs, the technical director, hails from Pennsylvania originally and he once was connected with the industry in Ohio. He is one of the leaders in the Lake States TAPPI section.

Frank X. Kreiling, a young man from Appleton, who formerly was with the Institute of Paper Chemistry there, is the superintendent of Mill No. 1, and he was elected last month as secretary-treasurer of the Northwestern Division of Superintendents.

Tour foreman in Mill No. 1 is Frank Siebers, who has two brothers who moved from Thilmany to the west to work under Bob Wertheimer at Longview Fibre Co. They are Tony Siebers, paper mill supt. at the Longview mill and Steve Siebers, who just recently became tour foreman at the same mill.

Bill Hoehne, welder at Thilmany's Mill No. 2, is a brother of Herman Hoehne, pulp mill superintendent at Longview Fibre.

COAST SUPERINTENDENTS HEAR ABOUT NEW EQUIPMENT

U. S. Foresters say industry must change processes and species to survive but they stir up questions on economics. Westinghouse and Black-Clawson representatives describe new facilities. Ackley elected Chairman.

A diversifiied program of talks featured the first renewal of the winter conventions of the Pacific Coast superintendents after four years of war. The subjects were well chosen to cover, in a broad way, major developments during that interlude in several fields of vital interest to the pulp and paper industry and the superintendents.

There were about 140 registered for the meetings in Seattle's New Washington hotel, Dec. 7-8.

Those who attended discussions heard one speaker list new improvements developed for paper machines and outline some of advances made in machine shop practice.

Another listed wartime electrical developments—some of which may be applied to pulp and paper making.

Progress with synthetic rubber and in the manufacture of pumps were discussed.

Even a review of Germany's wartime progress in the pulp and paper field was tossed in for good measure.

NEW PACIFIC COAST CHAIRMAN—CHARLES E. ACKLEY, Supt., Lebanon Div., Crown Zellerbach Corp., whose career has included service at Consolidated Water Power & Paper Corp., KVP, Oregon P & P, Hawley and Grays Harbor.

Forest Resources Appraised

A little snappy seasoning was added to this fare by inviting two U. S. Forest Service officials, who proceeded to "tell off" the coast industry as to some of the things it would have to do if it wished to survive. Their talks took the now familiar line of recommending closer use of good resources, including "an average of 17,000 bd. ft. (34 cords) of wood left on the ground after logging;" the development of new by-products, and "diversifying of pulp manufacture over the entire range of Pacific Northwest timber species."

The Coast Superintendents Division has never been known to take any challenge "lying down" and—true to its past— it bounced back with a little friendly closer questioning of some of the statements by the foresters which involved economic questions. When one questioner indicated personal doubts as to whether there was enough hardwood in the Northwest to keep a pulp industry thriving, H. J. An-

Top row (left to right): Hugh G. Mount, Pres. & Treas., and Fred E. Alsop, Vice Pres. and Sec'y of newly formed Hall-Mount Co. (chemicals), Portland, Ore.; A. S. Viger, Development Dept., Simpson Logging Co.; N. O. Galteland, formerly of St. Regis, now Instrument Supply Service, Tacoma; R. W. Simeral, Vice Pres. and Gen. Mgr., Fir-Tex Insulating Board Co., and Sid Drew, of Portland forming own company on return from service.

Lower row (l. to r.): W. R. Monette, Western Div. Mgr., Dicalite Co., Los Angeles; T. B. Dick, Northwest Mgr., Dicalite Co., Seattle; George A. Frogner, Cons. Eng'r on Pioneer-Flintkote developments, Los Angeles; Glen A. Phillips, Gen. Supt., Paper-Felt Mill, Pioneer-Flintkote Co., Los Angeles; Russell M. Cooper, Gen. Supt., and Dick Bledsoe, new Sulphite Supt., both of Powell River Co., Powell River, B. C.

AT SUPERINTENDENTS' CONVENTION: Top row (left to right): Radford Russell, Asst. Supt., Everett Pulp & Paper Co., who was Chairman of Nominating Committee; Sam Salmonson, Asst. Gen. Supt., Soundview Pulp Co., who retired as Division Chairman; R. V. Bingham, head of pump co.; R. T. Petrie, Coast Representative of Black-Clawson-Shartle Bros.-Dilts Companies, and Victor Vodra, Griffiths Rubber Mills. Latter trio were speech-makers.
Lower row (l. to r.): Albert S. Quinn, Vice Pres., Stebbins Eng Corp., who was Co-Chairman of Convention; Dr. Edward G. Locke, U. S. Forest Experiment Station (whose talk on Germany's standardization of yeast production from sulfite liquor will be published in PULP & PAPER INDUSTRY next month with illustrations); Fred Wellington, Western Gear Wks.; J. H. Moak, Master Mechanic, Soundview Pulp Co., and Bud Johnson, Engineer, Weyerhaeuser Tbr. Co. (Everett mill).

drews, chief of the Pacific Northwest Forest Service, suggested there was a lot of alder and maple in the National Forests that could be used.

There were also questions raised as to the potential pulp yield from alder by the sulfite process and its quality. Some of the superintendents indicated they weren't ready to join in "last rites" for the sulfite industry.

Mr. Andrews cited a survey of privately-owned stumpage to back up a prediction that some woods-using industries of the west "are going to have to go out of business." In the Puget Sound area—where he said conditions were similar to that in other Washington-North Oregon areas—he reported that 163 wood-using industries had only enough wood of their own to last five more years; that 72 had enough to last 5-15 years, but only 41 had enough to last over 15 years.

Although not including in his figures any public-owned timber, he did, as reported above, later "offer" hardwoods from the National Forests.

Among ways he suggested for extending the lives of woods industries was to thin out stands and utilize trees "that would die if not thinned out," but he had previously declared:

"I have grave doubts that publicly owned stumpage will be used very much to aid the mills that are using up their own stumpage."

He asked whether pulp industries would be able to compete with lumber mills for hemlock in the future; at what rate pulp mills would shift from sulfite to sulfate, thus making it possible to use "a greater number of timber species"; if there would be increasing integration of pulp and saw mills, in order to make more use of slabs; if there would be a material increase in hydraulic barkers in sawmills as well as pulp mills; and if thinnings from large areas of second growth would be used.

Dr. J. A. Hall, who just this year came from Washington to take charge of the Portland, Ore., Forest Experimental Station, said "we can't live together if we continue to cut only 40-year-old second growth." He predicted wood used in the west would be smaller and of different species than at present.

"Material now left in the woods make a better groundwood than the present product, he asserted.

He mentioned "pulp preforms" as potentially a large field for use of pulp in the future. In ten years, he said, new sources must be found for tannin, which can be made from hemlock bark, because the supply of tannin from Argentina and from domestic chestnut trees will be approaching the end. He thought there should be a good western market for yeast made from wood sugars for cattle feed.

He said the supply of high grade sulfite "is running short" and he thought the use of hardwoods in some Southern pulp mills was an example which the Pacific Northwest could follow.

Kendall Howe's Talk

Kendall L. Howe, distric manager, Westinghouse Electric Corp., Seattle, who participated in the Saturday afternoon program with the foresters, also touched on the future of the woods industries in his talk. His view was that by manufacturing more complete articles in the west—furniture as well as lumber, and this would mean paper products as well as pulp—that many more man-hours of work would be provided.

Mr. Howe reviewed the new electrical devices developed during the war, some of which could be of aid to the pulp and paper industry. He mentioned precipitation processes; radar, and high frequency heating. Also electronic means of determining off-balance of one-millionth of an inch; the great development of the gas turbine; new rectifiers of aluminum, instead of copper; a hand-lamp with fixed reflector of surprising range, and also the gun-

sight lamp who had to outshine the brilliance of the sun.

Petrie Sums Up

Robert T. Petrie, of Portland, who represents Black - Clawson, Shartle Bros. and Dilts Companies on the Pacific Coast, told how wartime restrictions or necessity brought forth new devises or processes serving papermaking machines. These were:

1. The simplex press, permitted more efficient use of presses.
2. Hydromanic inlet for better distribution of stock to fourdrinier wire or cylinder mold.
3. Airflex clutch (used on naval vessels) for paper machine drives where these were insufficient.
4. Constant tension device giving longer life to felt or wire.
5. Suction couch for cylinder machines and primary suction couch for fourdriniers.
6. Application of coaters to board machines.
7. Improvements in design of laminators.
8. New methods of agitation and stock refining.

Mr. Petrie also told of improvements in machine shop practice brought about by the war, as he witnessed them in his company plants.

These included development of new alloys; better technical controls; more complete and high - speed mechanized handling of materials; improved binders in core making; mechanical sand slingers for molding with a slinging head that reaches all parts of molds; hydrablast system to clean castings with 1200 psi water pressure and a variety of nozzles that will reach formerly inaccessible pockets; advances in welding including welding of dissimilar metals; tools with micrometer adjustments and push button controls; magnaflux for detection of flaws, etc.

Hydrablast cleaning eliminates dust in the cleaning department, he said, and permits obtaining a better class of employe. More extensive use was made of maintenance crews, especially on the long lathes used in making paper machines. Mr. Petrie said his company discovered that by having crews specialize in certain phases of the work, and follow each other in moving from one job to another, a real competitive spirit was encouraged and the crews took pleasure in "crowding" each other along.

With Mr. Petrie on a forenoon program was Victor H. Vodra, Griffith Rubber Mills, who told the story of the synthetic rubber development in which $700 000,000 was invested in plants in U. S.

All research started from scratch four years ago, he said, and already has produced a synthetic time superior to natural rubber tire for lightweight cars, butyl tubes that hold air many times longer than natural rubber, and rayon tire cord lighter and stronger than other cord.

He said the nation cannot hope for a return of natural rubber supply to its pre-war status before 1950-51, and that by that time the synthetic rubber products may be firmly established as superior.

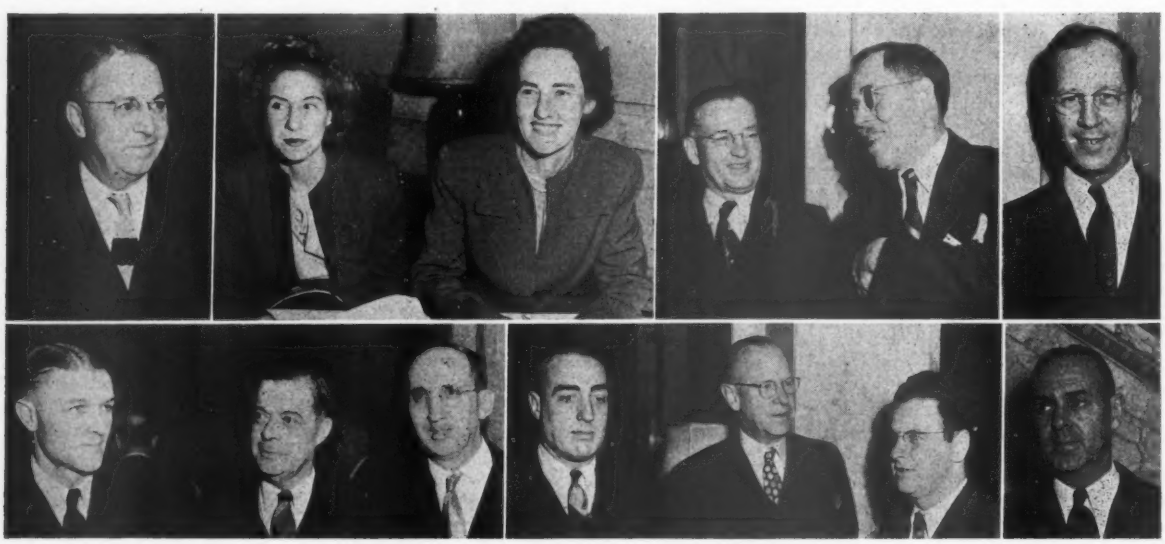
On this program, also, was R. V. Bingham, who heads a pump company, and who talked of developments in that field. He discussed hydraulic log barker pumps. Citing the difference between low and high pressure pump design, he mentioned the problem of side push, met by the development of a double volute system which accomplishes hydraulic instead of mechanical balance at all diametrically opposite points.

Talk on German Industry

"Observations on a Tour of German Pulp and Paper Mills," was the title of the principal talk at the luncheon, given by Dr. Edward G. Locke, of the U. S. Forest Experiment Station in Portland.

Dr. Locke was a member of the forest products group of the Technical Industrial Investigation which was organized by the Joint Allied general staffs (see "Veil Lifted in German Pulp and Paper Developments", page 22, November issue, PULP & PAPER INDUSTRY). Dr. Locke recalled that the GI's jokingly called the investigators "feather merchants" and the latter were first assigned to get information that

AT SUPTS. CONVENTION:
Top row (left to right): Doug Morris, in charge of reservations, and the ladies who did the job, Margaret Sherbrooke, Stebbins Eng. Corp., and Geneva Terwilleger, Jas. Brinkley Co.; H. J. Andrews, Pacific Coast chief of U. S. Forest Service; Dr. A. J. Hall, head of U. S. Forest Experimental Station, Portland, and A. E. Montgomery, Vice President, J. O. Ross Engineering Corp., who came from Chicago.
Lower row (left to right): John Guthrie, British Columbia Pulp & Paper Co., Woodfibre, B. C.; Loring "Bud" Wood, Plant Engineer, Grays Harbor Div., Rayonier Incorporated, Jerome L. Janecek, Gen. Supt., Inland Empire Paper Co., Spokane, Wash. (who came west from the old Cherry River mill of West Virginia); C. F. Trombley, Monsanto Chemical Co., Seattle; J. F. Smith, Sales Mgr., Gt. Western Div., Dow Chemical Co., San Francisco; Fred Armbruster, Sec'y-Treas. of the Supts. Division and Northwest representative of Dow, and James Ruck, Supt., Kraft Div., St. Regis Paper Co.



might benefit war production and later any information that might benefit U. S., British and Canadian industry.

Generally speaking, Dr. Locke said German industry was below par in U. S. as to engineering standards in matters of maintenance in the mills. He said the mills seemed to like to have plenty of spare equipment on hand in case of breakdowns and, in many ways, showed less efficiency than those in the U. S.

He mentioned a new low temperature glue for laminations as one of the few worthwhile new products discovered in Germany.

Most of his talk dealt with German developments in production of a stock or poultry feeding yeast from sulphite waste liquors and his report on this subject will be published in the January issue of PULP & PAPER INDUSTRY, with illustrations and photographs of equipment.

He said "there should be a market for such a product on the Pacific Coast." In Germany, he said, it was also a supplementary diet for human beings and that it was used to improve the quality of soups and many food stores had flaked yeast to sell.

Equipment which will be shown in next month's issue includes continuous fermentation equipment, an aereating wheel, defoaming centrifuge, etc., and a flow sheet of the standard German operation for this purpose. This standard design for 1,000-tons-a-year was agreed upon by the pulp industry at the request of the Reich.

"In general, the sulfite pulp mills in Germany which cooked spruce were producing alcohol from the waste liquor, up to 6½ million gallons annually," said Dr. Locke. "But when beech was processed for dissolving pulp, the waste liquor contained higher quantities of pentose sugars and was found to be less suitable for alcohol production. As a result, six sulfite mills in 1944 began producing yeast on the waste liquors. The installed capacity of these plants was about 14,000 metric tons annually. The end of the war stopped construction of a seventh plant."

Two other pulp mills, he said, were producing oidium lactis from the waste liquor for food material but their product was not accepted by the Wehrmacht.

In another pre-hydrolysis pulping process, two additional mills were producing larger quantities of dry yeast — one making 20,000 tons from straw and the other 12,000 tons from fir and pine. Acid hydrolysis of wood produced yeast up to 9,000 tons in five wood sugar plants.

TWO OF MOST INTERESTING REPORTS AT MEETING CONCERNED NEW WAR-INSPIRED APPLICATIONS FOR PULP AND PAPER.
Talks on this subject were by KENDALL L. HOWE (left), District Mgr., Westinghouse Electric Corp., Seattle, and ROBERT T. PETRIE, Western Rep., Black-Clawson, Shartle Bros. and Dilts Cos.

Albert S. Quinn, formerly secretary-treasurer of the division and vice president of Stebbins Engineering Corp., was toastmaster at the luncheon at which he presented a life membership in the Superintendents' Association to the retiring chairman of the Coast Division, Sam Salmonson, assistant general superintendent of Soundview Pulp Co. Past chairmen's certificates went to Bob Heuer, Merrill Norwood, Tony Siebers and Mr. Salmonson.

New Officers

At the business meeting, these new officers were elected:

Chairman — Charles E. Ackley, paper mill supt., Lebanon, Ore., Div., Crown-Zellerbach Corp.

First Vice Chairman — Gerald F. Alcorn, manager, Everett, Wash., Mill, Pulp Div., Weyerhaeuser Tbr. Co.

Second Vice Chairman — Chester Mulledy, superintendent, Port Angeles, Wash., Div., Rayonier Incorporated.

Secretary-Treasurer—Fred Armbruster, Dow Chemical Co., Seattle.

Radford Russell, assistant superintendent, Everett Pulp & Paper Co., was chairman of the committee which reported the new slate of officers.

Mr. Ackley reported on membership. He said the division was third largest in the country with 87 paid-up members and about 100 on the rolls.

Chairman Salmonson said it had been decided, at a meeting with the Pacific Coast TAPPI Section executive committee, to hold a joint Superintendents-TAPPI meeting in the spring of 1946, probably in some resort town in Oregon. It was decided to hold the meeting in May in order that Raymond L. Barton of Michigan Paper Co., Plainwell, Mich., who is national president of the Superintendents, could attend. He would have to be in the east in June for the national meeting. It was also agreed that a resort would be more likely to be available for the meeting in May than in June.

Bob True of General Dyestuff Corp., and Mr. Armbruster, were delegated to arrange for dates at an Oregon resort if possible.

Mr. Ackley, who takes over the division gavel, was born in Antrim county, Michigan, but his first mill job was in Camas, Wash., in 1910, where he remained seven years, working up to machine tender. Then he returned to the Middle West for a period of seven years, during which time he was employed at Consolidated Water Power & Paper Co. at Stevens Point, Wis., and at Kalamazoo Vegetable Parchment Co., Parchment, Mich.

He returned west in 1926 as night superintendent at Oregon Pulp & Paper Co.; in 1928 went to Grays Harbor to start up the pulp dryer in the new Rainier mill there and spent seven years there as tour boss of the paper division. In 1937, Mr. Ackley went to Hawley Pulp & Paper Co. as general superintendent and in 1941 transferred to his present position at Lebanon.

He is married; has three children and four grandchildren.

There were the usual festivities

(Continued on Page 48)

Sorg Announces Plans to Expand Pulp Production 50 Per Cent

Expansion and improvement at Sorg Pulp Co. at Port Mellon, B. C., to cost $1,500,000 during the next three years, is announced by the parent company, Sorg Paper Co. of Middletown, Ohio.

The pulp mill and sawmill at Port Mellon were purchased from the Leadbetter interests in 1941.

The pulp mill supplies the six paper-machine Sorg mill at Middletown and shipped quantities of kraft pulp to the Australian and South American markets as directed by the Canadian pulp controller during the war.

"The success of these operations during the war years has influenced the Sorg directors in their decision to modernize the pulp manufacturing plant and increase its capacity from 100 tons to 150 tons of unbleached kraft pulp, in order to place it in position to meet competition of the postwar market."

The following major improvements will be carried out under the direction of H. M. Lewis, vice president and general manager at Port Mellon:

1. A modern chemical recovery plant of 150 tons capacity, being manufactured by Combustion Engineering Corp., Ltd., of Montreal, with major parts manufactured in various Vancouver shops.

2. Additional steam turbo-generator units.

3. A modern pulp washing system of the Swenson Nyman type.

4. Additional vacuum evaporator units of a type not yet selected.

5. Sawmills improvements, which include installation of hydraulic log barking equipment.

6. Additional chip storage and handling capacity.

7. Yard improvements to include facilities for handling pulpwood.

8. Booming ground improvements.

9. Townsite improvements, to include additional housing, hotel and recreational facilities.

10. Improvements to docks to facilitate the handling of raw materials.

11. Drying machine and screen room improvements.

12. Water system improvements and the installation of oil burning equipment.

Mr. Lewis advises PULP AND PAPER INDUSTRY that orders have been placed for substantial quantities of equipment, and construction will commence as soon as plans are completed. Most of the machinery used will be made in Canada.

Officers of Sorg Pulp Co. are: Chairman of the Board, J. A. Aull, Sr., Middletown; president, J. A. Aull, Jr., Middletown; vice president and general manager, H. M. Lewis, Vancouver, B. C.; treasurer, R. H. Tupper, Vancouver; directors, including the above, and D. G. Driscoll and L. C. Currier, both of Middletown, and H. C. Lange of Dayton, Ohio.

Mill manager is C. M. Belden, Port Mellon. Head office of the company is in the Royal Bank Building, Vancouver.

J. ELTON LODEWICK, for three past years with WPB Log and Lumber Administration, Portland, Ore., and previously the Forest Service, has become Forest Products Analyst for Bonneville Power Administration, Portland. Mr. Lodewick will serve as liaison with forest industries. He will study new power requirements resulting from introduction of hydraulic log barkers, hogged fuel decline, etc.

Robt. Gair, Inc., Will Build New Mill at Savannah

Robert Gair Co., of New York, operators of 12 board and box mills in New England, New York and Eastern Canada and 19 converting plants, has changed its mind about the location of its new projected paperboard mill in the South.

It now plans to build on deep water frontage at Savannah, Georgia, instead of near Orangeburg, S. C., as previously announced. The change was made when the previous program was disrupted, according to Robert W. Nelson, port executive in Savannah.

A dock to load finished products on ships will be built at the new mill site.

Westfield Buy Glassine Paper Co.

The Westfield River Paper Co., Inc., of Russell, Mass., announces that it has acquired the Glassine Paper Co. of West Conshohocken, Pa., as of Nov. 29. Manufacturers of high quality glassine papers with mills at Russell and East Lee, the Westfield firm through this purchase will have five machines operating on glassine and greaseproof papers, and becomes the third largest factor in the glassine and greaseproof industry.

Officers of the Westfeld River Paper Co., are: Paul F. Moore, president and general manager; Leif B. Norstrand, vice president; and John J. Costello, secretary-treasurer.

Commander Robert F. Nelson, former president of the Glassine Paper Co., and George T. Fritz, vice president and treasurer, have announced their resignation, the latter having decided to retire from the paper industry.

C. M. Connor, vice president and general manager will stay on.

News Price Increase

It is reported that OPA has approved a $6 boost in the newsprint price in January, 1946, bringing the price to $67 a ton. In the '20s it went beyond $100 but slid off to $37 during the depression.

Only eight U. S. mills are now making news.

Niles Anderson and Dr. Kraft Report on Their Trip to Sweden

Sweden has made considerable progress in research on new products and derivatives from wood and wood cellulose and is now laying the foundation for very extended and promising developments. Most of the mills have been modernized and improved but it may be a matter of some time before Swedish pulp — particularly the highly bleached and refined types — will be shipped in quantity to the United States.

These conclusions were reached by Niles M. Anderson, vice president and manager of Marathon Paper Mills of Canada, Ltd., Toronto, who returned late in November from a trip to Sweden covering more than a month. He was accompanied by Dr. Ferdinand Kraft, technical director for Marathon, and interviewed in New York by PULP & PAPER INDUSTRY.

Mr. Anderson and Dr. Kraft flew east via Swedish Air Lines on one of the converted B-17's interned in Sweden during the war. The hops were New York to Maine, Labrador, Iceland, Stockholm. Due to a careful advance planning, Mr. Anderson and Dr. Kraft visited almost every mill in north and central Sweden.

Mr. Anderson expressed himself as being particularly impressed with the large Research and Development Laboratories which now exist at Oernskoeldsvik (Mo och Domsjoe) or which near completion at Kubikenborg (Svenska Cellalosa Aktiebolaget). Here two of the largest Swedish pulp concerns concentrate on the improvement of processes, products and development of a new chemical industry.

Considerable attention was paid to Swedish wood handling methods, removal and use of bark, etc.

"Sweden has made great progress in the last few years on wood chemical research," Mr. Anderson said, "and she is now embarking on as complete a program of pure pulp research. I would say she is ahead of Canada and the U. S. on derivative research projects."

New mechanical developments include the Jonnson rotary screen and a new chain log barker. The barker is operated by 25 hp. and the log is run through four chains which are fastened on two discs. Perfect control is possible in adapting the barking to various size logs.

The southern part of the country has overcut their forests about 30% but the northern forests are still in good shape, said Mr. Anderson. Wood costs are very high.

A little while ago, chlorine and caustic were in very short supply. This situation is slightly relieved now due to full-scale operation of all the electrolytic plants, some now being enlarged. Two or three mills are building for manufacturers of new bleaching agents.

Swedish machine shops which have been in the pulp and paper business are constantly working on improvements. They have three to five years of orders on their books.

"The Research Laboratories are amazing," Dr. Kraft said, "not only those of the various companies but especially the Traeforskuingsinstitert at Stockholm, now almost completed. Prof. Hagglund and his collaborators showed me through the big building. The prize piece seems to be a drying machine for pulp and paper, about 30 inches wide but full size in the vertical and of a flexibility almost unheard of."

Mr. Anderson and Dr. Kraft came back by courtesy of the Air Transport Command in a DC54, 32-passenger Skymaster. The trip was made in about 24 hours. Both gentlemen were full of praise for the comfort and performance of this wonderful plane.

Among the mills visited by the two men:

Oervikens Sulfit Fabrik
Mo & Domsjo Company at Oernskoeldsvik and Husum
Svenska Cellulosa A.B., at Oestrand, Kubikenbors, Svartvik and Essvik
Korsnaes Saagsverk A.B.
Stora Kopparsberg A.B.
Uddeholm at Skoghall
Billerud at Gruvoen

IMPORTS OF SWEDISH PULP

(V-E Day Through Nov. 29, 1945—First postwar shipment was June 25)

	Short Tons	Value Dollars
Unbleached groundwood	18,026	$ 685,466
Bleached groundwood	1,177	43,098
Unbleached sulphite	197,727	12,335,551
Bleached sulphite, rayon and special grades	3,536	299,984
Other bleached sulphite	41,278	3,075,774
Unbleached sulphate	175,195	10,743,395
Bleached sulphate	23,211	1,696,621
All soda pulp	39	2,119
Unclassified	1,338	77,992
Total	461,527	$28,960,000

Data supplied by the U. S. Bureau of the Census.

BACK FROM ONE MONTH IN SWEDEN ARE NILES ANDERSON (left), Vice President and General Manager of the new bleached sulfate pulp mill at Marathon, Ont., being built by Marathon Mills of Canada, and his Technical Director, DR. FERDINAND KRAFT (right).

Mr. Anderson visited practically every mill in Sweden and was impressed by technical advances made in that country, he told PULP & PAPER INDUSTRY.

"Southern part of Sweden has over-cut forests but this is not the case north of Stockholm," he said.

Texas Wood Firm Formed by Champion

The Texas Forest Farms, Inc., a newly-formed subsidiary of the Champion Paper and Fibre Co. of Pasadena, has purchased the C. Y. Townley pulpwood business of Huntsville, including equipment and trucks.

Mr. Townley will be general manager of the new corporation, as well as head of the wood procurement department of Champion Paper and Fibre Co., Houston division, at Pasadena.

W. R. Crute, plant manager for Champion, is president; Thomas W. Alexander, vice -president; Charles W. Dabney, Jr., treasurer; William A. Vinson, secretary.

New Memphis Box Plant

A new $300,000 plant, 400x250 feet, is being built in Memphis, Tenn., by Valley Fibre Box Co. It will make corrugated shipping cases and other products and employ 150. J. T. Mendenhall is president.

New Container Plant

Establishment of a new Cleveland Container Co. $300,000 plant in Memphis, Tenn., to make plastic articles and paper cans and containers, is announced by W. F. Walker, president of the company. William Haughey will be manager. He took charge Dec. 1 at the former Caine Steel Co. plant which is being revamped.

Development of Hydraulic Barker At Hummel-Ross Fibre Corp.

Although a great development of hydraulic barking has occurred in the Pacific Northwest, the forest products world also doffs its hat to a Virginia industry, Hummel-Ross Fibre Corp., for the work it has done in pioneering in the development of equipment to remove bark by high pressure jets of water.

A slab barker, using the hydraulic principle, has been developed by that company and is now in full-time commercial operation. The Hummel-Ross mill produces 300 tons of sulphate fiber daily which it converts into a like amount of kraft paper and board for liner, special boards, plastics, leatherette, etc. Pulp is prepared for both a Fourdinier and cylinder machine.

The mill is at Hopewell, near Richmond, in the tidewater region of eastern Virginia.

Fred Hummel, president of the Virginia company, has worked on slab barkers since 1920 and the hydraulic barker he has now completed, with the assistance of his engineering staff, is a conversion of barking equipment he developed 20 years ago. The original machine is used, high pressure nozzles replacing the old barking equipment.

FRED HUMMEL, President, Hummel-Ross Fibre Corp., Hopewell, Va., who developed that mill's hydraulic slab barker.

The first experiments by Hummel-Ross with hydraulic barking were started on March 16, 1943. The first semi-commercial run was made on June 24, 1943. Since that time the operation of the machinery has been improved and it is now in full operation.

Credit is due Mr. Hummel for his original development work and application of the hydraulic principle to the present machine, and G. H. Mathias, of the engineering staff, who supervised the actual construction of the equipment. While primarily a slab barker, the machine is fairly satisfactory on round wood, also.

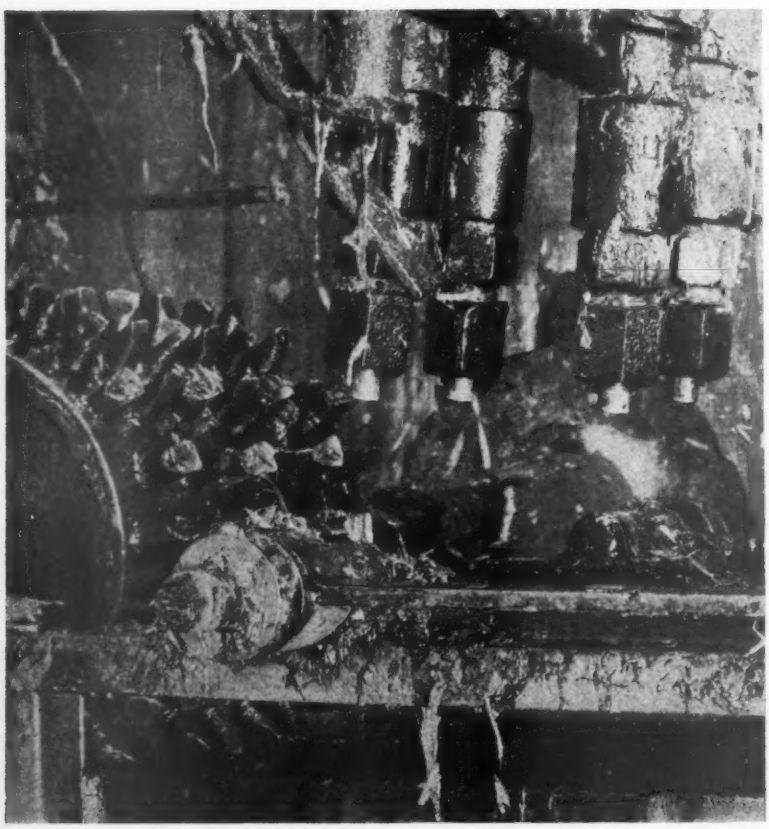
Fig. 1 shows the old original machine with chain hammers. Fig. 2 shows the arrangement of the equipment used.

The water is waste from the pulp mill and is pumped to the barker at the rate of 545 gpm under a pressure of 1050 psi. Slabs, delivered by truck, are brought to the machine by conveyor.

After barking, the slabs are conveyed to an outside chipper, from which the chips go to the Wood Room. Bark and water are caught under the machine and directed through a pipe to a gravity screen, where the water passes through the screen to the sewer and the bark continues down to the conveyor which carries refuse to the bark burner.

A fourstrand chain conveyor is planned to receive slabs from railroad cars and trucks, to take care of surges in slabs received, and construction of this conveyor will begin in the near future.

A CLOSE-UP OF THE HUMMEL-ROSS HYDRAULIC SLAB BARKER. The four de-barking nozzles, from which stream hits slabs at pressure of 1,050 pounds per square inch, are shown. Fred Hummel, President of the Virginia kraft pulp-paper-board mill, developed this barker.



Description of Barker

The barker is housed in a frame shelter with safety glass panels through which operation can be observed. It will accommodate slabs up to 14" in width and passes them through, end to end, at a speed of 192' per minute, under four Worthington No. 3 debarking nozzles. Slab lengths range from five to sixteen

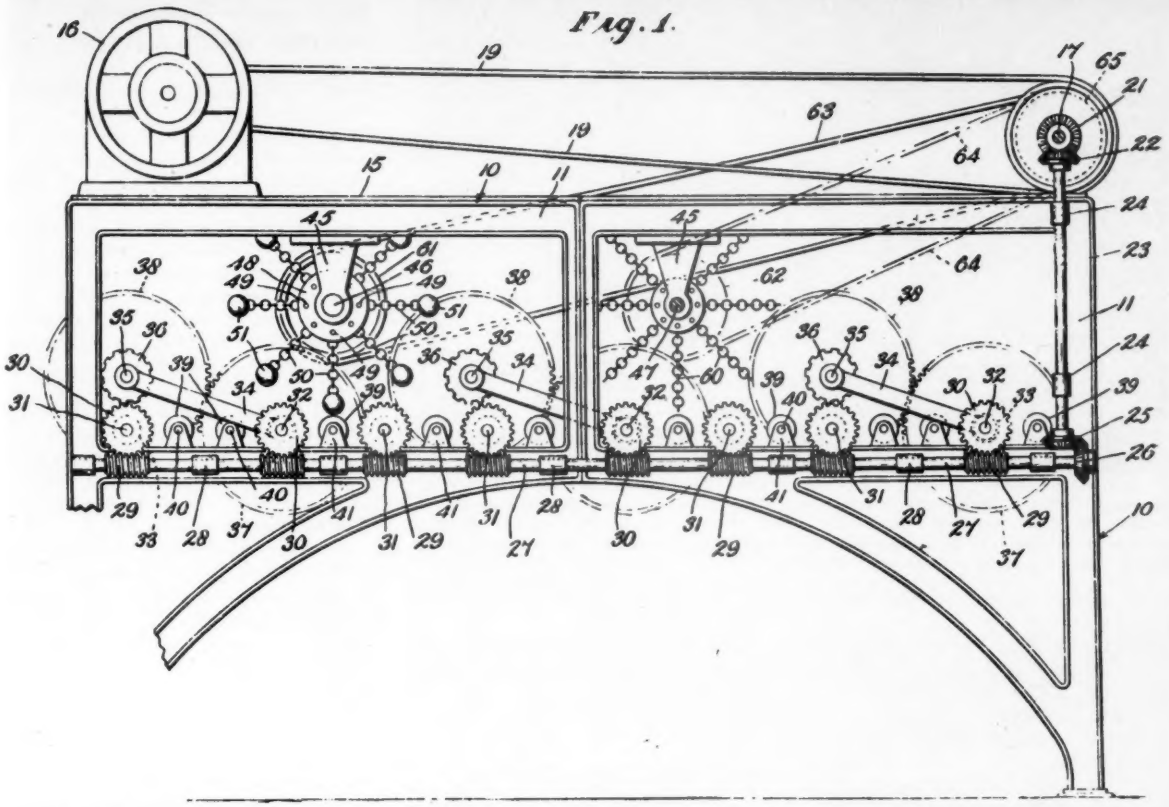


FIGURE 1—THE ORIGINAL BARKING MACHINE developed 20 years ago by FRED HUMMEL, now the President of Hummel-Ross Fibre Corp., at Hopewell, Va. This is reproduced from an old photostat of a patent drawing. No attempt is made here to identify the numeral markings, but on this particular barker, chains and nozzles were used instead of nozzles. In the new Hummel-Ross barker the feed principle is very much the same but nozzles are substituted for chains. In fact, the original 20-year-old chassis is now being used in the new barker.

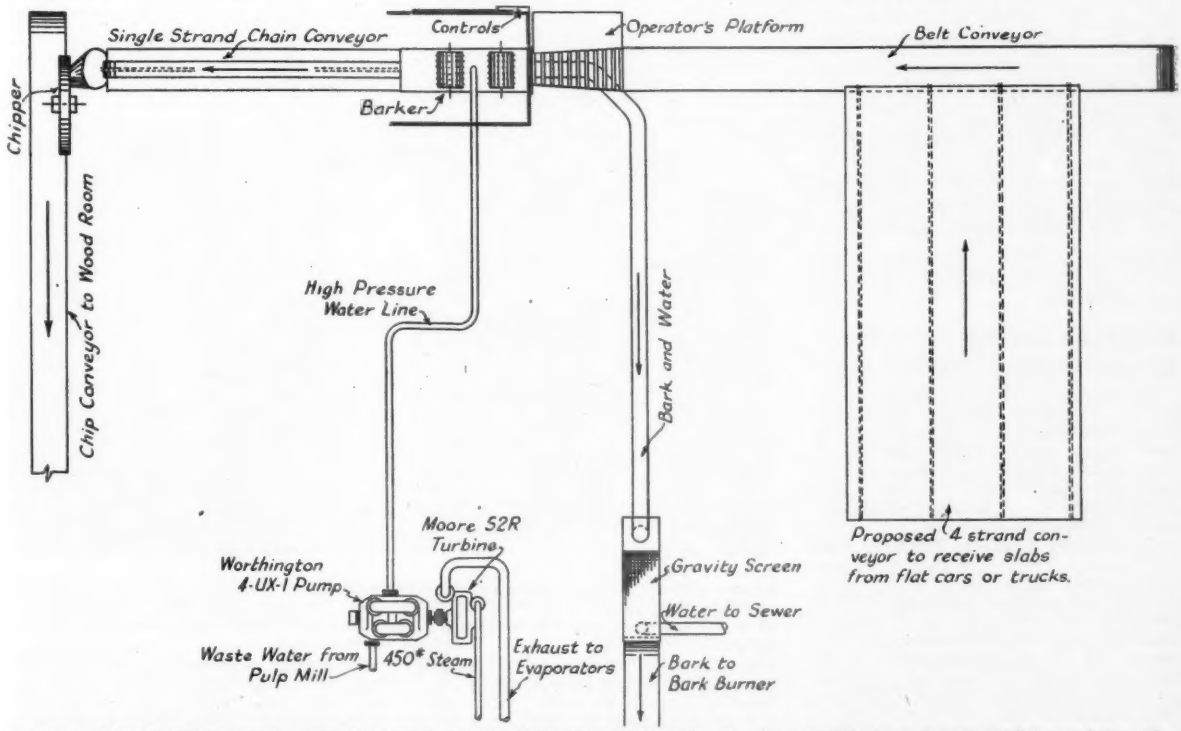
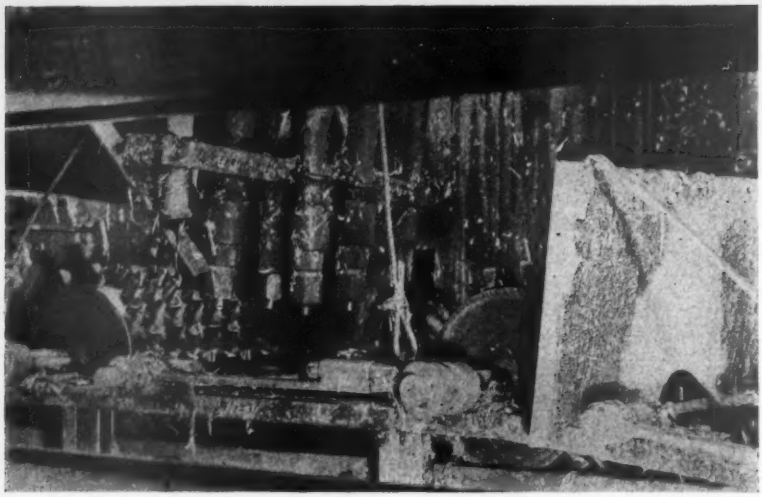


FIGURE 2—FLOW SHEET SHOWING GENERAL LAYOUT OF HYDRAULIC SLAB BARKER developed by Fred Hummel, President of Hummel-Ross Fibre Corp. A description of the equipment as shown here and the operation of the machine is given in detail in the accompanying article.



HERE IS A GENERAL VIEW OF THE HUMMEL-ROSS SLAB BARKER, showing the major equipment, including the nozzles and feed rolls. Photo was taken through the Herculite glass windows that are used for inspection of the performance of the equipment. This accounts for the spots on the picture, which are pieces of bark and inner skin sticking to the windows.

feet. After leaving the barker, a single strand of Rex 0326 chain with angle iron flights conveys the slabs to the chipper. The barker is driven by an Allis Chalmers motor (5-hp, 850 rpm) through a chain drive reduction and long shafts having universal joints. The entire drive is located outside of the barker house, only the shafts passing through the wall to the spiked drums.

Water pressure is furnished by a Worthington 4-UX-1 multi-stage pump. The pump is driven by a Moore S2R steam turbine developing 535 hp. at 3600 rpm. on 450 lbs. steam. With slabs of average size, production of ten to twelve cords per hour is possible.

A. T. Nielsen and J. E. Holveck of Worthington Pump & Machinery Corp., assisted in developing nozzles suitable for slab barking service.

H. C. (Kentucky) Hanser was the mechanic assigned to getting the bugs out of the equipment, and did a splendid job.

Southern Safety Men Organize New Group

Approximately 60 delegates from pulp and paper mills of southern states participated in a safety conference in Jacksonville, Fla., Nov. 5 and 6. The group adopted the title of the Southern Pulp and Paper Association. D. J. Brett, Jr., safety director of National Container Corp., Jacksonville, presided.

H. E. Newbury, Ecusta Paper Co. Pisgah Forest, N. C., was elected executive committee chairman. D. J. Brett, Jr., was named secretary-treasurer. Other members: C. W. Howard, West Virginia Pulp & Paper Co., Charleston, S. C.; George W. Merriman, Southern Kraft Div., International Paper Co., Mobile, and O. J. Sherman, Gaylord Container Corp., Bogalusa, La.

The next meeting will be July 8 in Ashville, N. C.

Licensed to Use Sale Double Flow Box

Fred Hummel, president of Hummel-Ross Fibre Corp., announces the licensing of Container Corp. of America to use the Sale double flow box. Thirteen other paper companies have been licensed on use of this equipment.

The Sale double flow box invented by John W. Sale, vice president and general manager of Hummel-Ross, lays a secondary layer of stock on the base web of stock on a Fourdrinier machine. By use of this device, secondary materials can be used as either top or base sheet. Different colors can be used in top and base and either side of sheet can be sized.

Downington Testimonial For Cliff Walton

G. C. (Cliff) Walton, for 25 years with the Downington Manufacturing Co., Downington, Pa., and well known in the industry, was given a testimonial dinner recently to commemorate his quarter-century with the firm.

He started in the wood shop in 1920, moved through all deparments of the plant, and is now personnel manager. From 1936 to 1942 he was on the road as salesman and became a familiar figure around many mills.

John Hay Elected Marinette Vice President

John B. Hay has been elected a vice president of Marinette Paper Co., a wholly owned subsidiary of Scott Paper Co.

Directors also announced election of C. Edwin Ireland as assistant treasurer and Samuel Armstrong as assistant secretary. Mr. Ireland is also assistant treasurer of Scott Paper Co., and Mr. Armstrong a member of its legal staff.

As vice president, Mr. Hay will direct all operations at both the Glens Falls and Fort Edward N. Y., plants of the Marinette Co. The Fort Edward mill was purchased about a year ago from International Paper Co. Mr. Hay has been general manager of these plants since July of this year. Prior to that time he was director of products standards for Scott Paper Co. in Chester, Pa. Earlier he was Scott's export sales manager.

POWELL RIVER CO. appointments (left to right): RICHARD C. BLEDSOE, who succeeds the late Frank Hamilton as Sulfite Supt.; JACK GEBBIE, new Personnel Counsellor to handle affairs of returning service men, and HAROLD FISK, of Montreal, Company Representative in Eastern Canada.

Mr. Bledsoe, who has been with the Powell River, B. C., mill for 22 years, continues temporarily to act as Control Supt., also, a position he has held since the promotion of Harry Andrews to Technical Director. Mr. Gebbie, former Asst. Beater Room Supt., heard of his new job while in a slit trench north of Rimini, Italy, with the Saskatoon Light Infantry. Mr. Fisk, civil engineering graduate from McGill U., has been Special Assistant to the Newsprint Administrator in Montreal.

Reminiscing With Delaware Valley TAPPI Section

On the evening of this December 7th members of the Delaware Valley section of TAPPI walked or rode past the squares of Philadelphia toward the venerable Engineers' Club (1877) where for many years they have been meeting on the first Friday of each month. Some of them may have been mindful that it was "Delaware Day" (the 158th anniversary of Delaware's ratification of the Constitution) but others were more conscious of the fact that it was the anniversary of the attack on Pearl Harbor. For this winter the Delaware Valley section has been devoting its meetings definitely to those postwar themes which were impractical or impossible during the hectic years of the war.

This month's meeting was built around a paper by Phil Goldsmith, Pusey & Jones, on "The Streamflow Vat." It was one of several papers the section has heard this winter on new methods and equipment and there will be more. Mr. Goldsmith was introduced by Glenn T. Renegar, remembered as a Purdue football star and now a superintendent for the Container Corp. He introduced the speaker for Dr. A. L. M. Bixler, Riegel Paper Co., chairman of the section.

No eastern TAPPI group gathers earlier on a meeting night, has better attendance, or displays any more spirited interest than this group. Probably, too, no other TAPPI group has more talent right within its membership. Rarely does the program committee go outside the roster for a paper—or a toastmaster, either. For the M. C. job there are men like J. R. Dufford, vice president of Paterson Parchment Paper Co. And for another example, few men in the business can make a technical paper more interesting than John Roslund, of Asten-Hill.

But to name names in the Delaware Valley section is to be perhaps unfair to a membership in which there are many experts and in which almost every man and woman takes a keen interest in TAPPI.

Too unusual to be typical, yet exemplifying the group loyalty which is apparent at every meeting, is the record of C. M. (Mike) Connor, Glassine Paper Bag Co., who held offices for six years including that of secretary - treasurer, vice - chairman and chairman. For three years now the secretary-treasurer has been Lois V. Hand of the experiment station of Hercules Powder Co., Wilmington.

To the best of memory of a predinner group at the meeting, the first chairman was William Maull, Mead Corp., now at Chillicothe but still well remembered in the Delaware Valley group. That was 15 years ago, and the earlier meetings were in the Penn A. C. A few years ago the group moved its meeting headquarters appropriately to the pleasant surroundings of the Engineers' Club on Spruce Street in Philadelphia.

According to Dr. Bixler, 1945-46 chairman, the group will continue to pursue subjects that were either developed during the war years or which had to be held in abeyance during them. Visitors are welcome, naturally, and each month several come by the short train ride from New York. Meetings close early enough to get even the out-of-town members back home by midnight.

Fritz In Chicago For United Paperboard

John J. Fritz has been named Chicago sales representative of United Paperboard Co., it is announced by Harold W. Kephart, vice president in charge of sales. Mr. Fritz will make headquarters at 234 Engineers Bldg., Chicago. His 18 years in the industry includes connections with Container Corp. of America and Union Bag and Paper

CLARK AND VICARIO FORM ENGINEERING AND SALES COMPANY

CARL VICARIO, JAMES SMITH and CARLETON CLARK of Clark and Vacario, Graybar Bldg., New York City, representatives for Nash Engineering Co., looking over engineering data for a mill expansion.

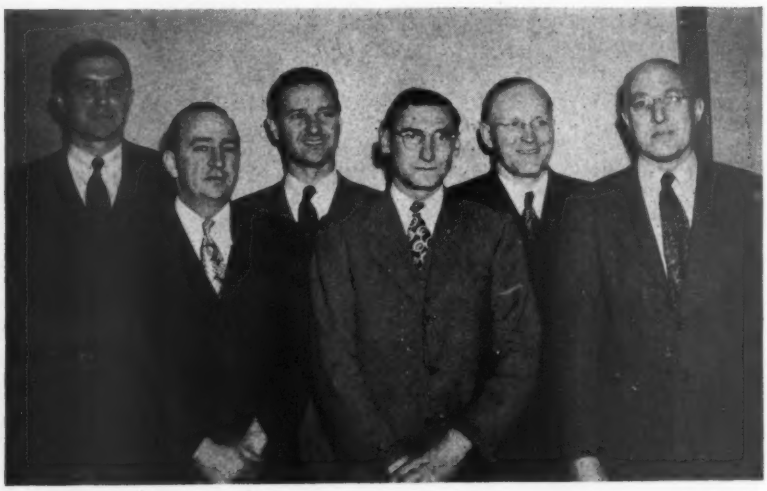
On August 15 last, Carleton L. Clark and Carlo Vicario, well known to the paper industry for past fifteen years, formed Clark & Vicario Company, with offices in the Graybar Building, New York 17, New York. They represent the Nash Engineering Company in the territory formerly covered by its Pulp & Paper Division.

During the early years of the war, they handled Nash pumps for special war uses, in addition to maintaining contact with the pulp and paper field. Their activities centered in the Buna-S synthetic rubber industry, but extended to the application of pumping equipment to altitude chambers for the Air Corps and the Navy and to various special fields in chemical warfare and explosives. In the summer of 1944, Vic was transferred to South Norwalk to handle special problems for Nash Engineering Co. and Carl Clark succeeded him as manager of the Pulp & Paper Division. As the war drew to a close, these friends of long standing decided to pool resources and start in business for themselves, serving the paper industry. They will represent one, or perhaps two, equipment manufacturers, in addition to Nash.

James A. Smith joined the Nash organization in January 1944, and made rapid strides in acquiring experience in the paper industry field.

RESINS AND PAPER INDUSTRIES COMPARE NOTES ON PROGRESS

Two talks on pulp-paper resin applications given at Seattle TAPPI Round Table are given in this issue of PULP & PAPER INDUSTRY (Pages 49-56); Others will appear in January.



RESINS PANEL at TAPPI meeting in Seattle Dec. 4:
Front row (left to right): KEN YOUNGCHILD, American Cyanamid & Chem. Corp.; D. V. REDFERN, Adhesive Products Co.; A. J. NORTON, Consulting Chemist.
Back row (left to right): H. L. WAMPNER, Reichhold Chemicals; J. B. HYDE, Crown Zellerbach Corp.; REMI BOLLAERT, Westinghouse Electric Corp.

The greatest concentration of technical information and advice on all the possible practical applications of synthetic resins to pulp and paper ever staged anywhere, took place on the University of Washington campus, Seattle, Dec. 4.

The occasion was the bi-monthly Pacific Coast TAPPI sectional meeting. But inasmuch as the subject of resins was concerned, it was universal—rather than sectional. Both paper industry and resins industry men who have been "making" resins meetings in all parts of the country in the past few years were unanimous in remarking there had "been nothing like it" ever held before.

At least for a few hours, Seattle was the real hub of the resins "world" and participants in the symposium were men whose background of experience included New York, New England, the South, and actual personal leadership of the development of resins by some of the leading producing companies.

In this issue of PULP & PAPER INDUSTRY two of these papers are published (on pages 49-56) and others will be published next month.

Also in this issue is the completion of the presentation of papers in the symposium on sulfite waste liquor, which was the subject of the Oct. 9 meeting of the Pacific Coast TAPPI group at Camas, Wash. About half of these papers appeared in the November issue of PULP & PAPER INDUSTRY and the remaining set begin on page 58 of this issue. Thus, in the two issues—November and December—is a complete report on the panel discussion of the utilization or disposal of sulfite effuent.

In these two consecutive meetings, the Coast TAPPI has staged full-scale panel discussions—as diverse as any that are held at the annual national meetings in New York's Commodore—and on subjects of real timeliness and widespread interest.

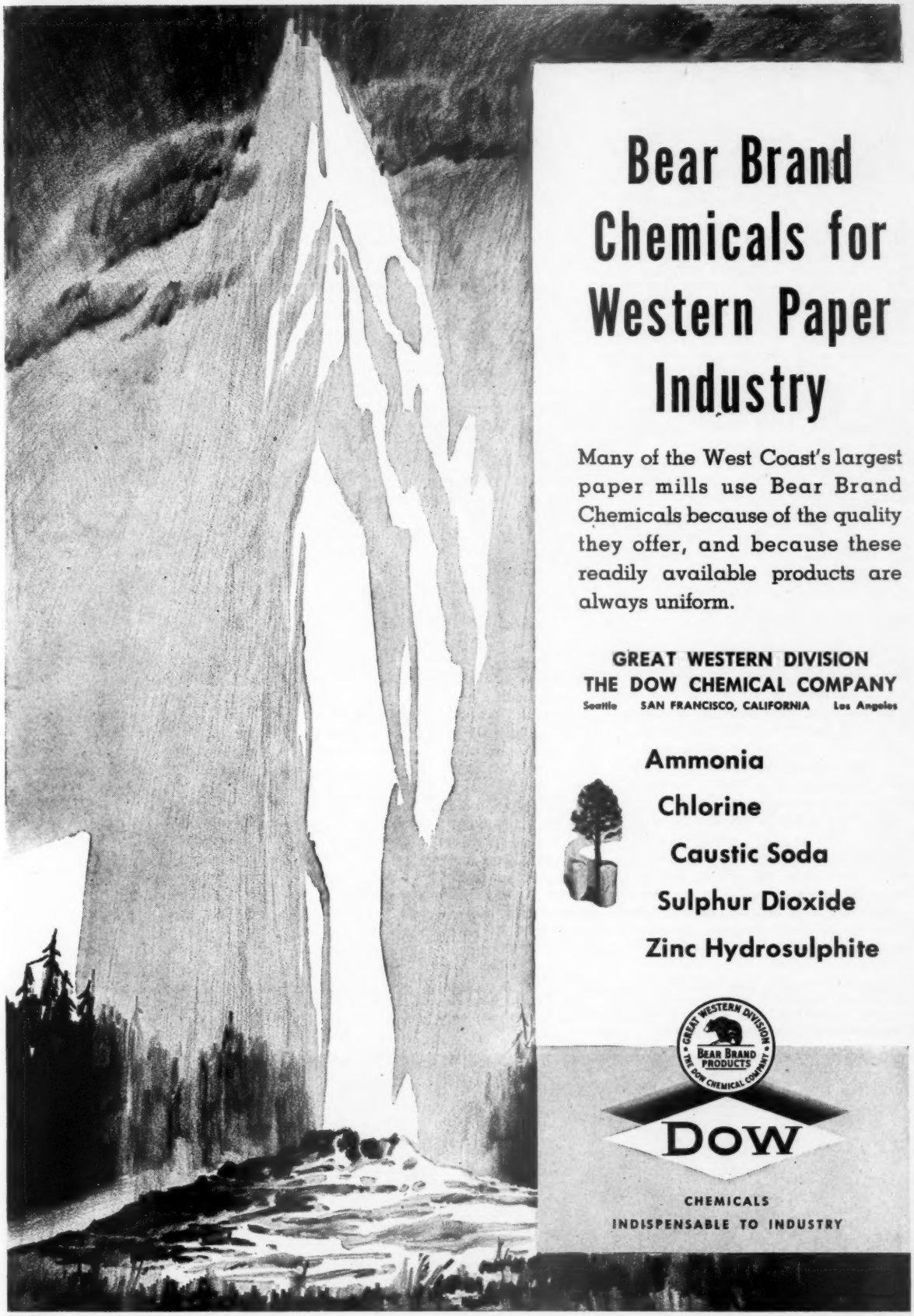
Next Meeting Feb. 5 In Longview, Wash.

Apparently, this TAPPI group intends to keep carrying the ball down the field in the same impressive manner, for the Coast TAPPI announces that its next meeting—in Longview, Wash., on Tuesday, Feb. 5—will be featured by a symposium on the subject: "Utilization of Wood Waste."

There is probably no subject they could have chosen of more significance to the permanence of the pulp and paper industry on the North American continent than this one. It is bound to be a meeting just as lively and well-attended as the previous two.

It will start at 2:30 p. m. in the Women's Club on Kessler Boulevard, Longview, with Dean Paul Dunn, forestry school, Oregon State

More at TAPPI meeting (left to right): Ronald Benson, Carl F. Miller Co., Seattle; Bob Pierce, Penn Salt Mfg. Co. of Wash., Tacoma, Wash.; Halvar Lundberg, Seattle; Allen Cadigan, Tech. Dir., Kraft Pulp Div., St. Regis Paper Co., Tacoma; Irving Gard, Merrick Scale Mfg. Co., Seattle; J. V. B. Cox, Hercules Powder Co., Portland, Ore.



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Old Faithful

The chairman and principal speaker at Seattle TAPPI dinner, Dec. 4, are at left: Harold Bialkowsky, Tech. Director, Everett mill, Weyerhaeuser Tbr. Co., and chairman of the Coast Section, and Dean L. R. Guthrie, Graduate School, Univ. of Washington.
In next group, Jerry Norton, consulting chemist, sits between Dr. H. K. Benson, who has written many technical publications over a long career, and 26-year-old Russell Graff, of Longview Fibre Co., who—just a couple hours before this was taken—had presented the first publication of his brand new career. Dr. Benson, head of chemistry and chemical engineering at the University, may soon retire. Young Graff's paper was entitled "A Study of Cottrell Precipitator Operations" and will appear in a later issue of PULP & PAPER INDUSTRY.

College, as the moderator. Dinner and a program of entertainment will follow at 6:30 at the Longview Country Club.

The three-point decision of the far western TAPPI section, as decided by a poll of members: (1) to hold technical sessions in the afternoons, preceding the dinner; (2) to confine the meeting to a single general subject, with presentation of different phases of the subject, and, (3) to confine the evening to entertainment, has been greeted with enthusiastic support.

Summary of Meeting

The Dec. 4 meeting, in the lecture room of the University's new Bagley Hall, was attended by about 100 persons. Dr. H. V. Tartar presided over this session, assisted by Dr. L. McCarthy. Both are in the University's chemistry department and are participants in the pulp mills-financed waste liquor research project now being conducted there.

The first presentation was another entry in the annual Shibley Award contest for papers by western operations men, this one given by 26-year-old Russell Graff, of the Longview Fibre Co., on the subject: "A Study of Cottrell Precipitator Operation."

Papers and participants in the resins symposium:

"Uses of Resins in Paper," by J. B. Hyde, director, waxing paper division, central technical dept., Crown Zellerbach Corp., Camas, Wash.

"Pulp Molding," by A. J. Norton, Seattle consulting chemist, formerly active in New England industry.

"Composite Laminates and Overlays," by D. F. Redfern, chief chemist, Adhesive Products Co., Seattle.

"Melamine Resins for Wet Strength Papers," by K. E. Youngchild, supervisor of paper specialties, American Cyanamid & Chemical Corp., New York.

"Urea Resins for Wet Strength Paper," by H. L. Wampner, director of technical service, Reichhold Chemicals, Inc., San Francisco.

"High Frequency Electrical Heating Applications to Pulp & Paper Products," by Remi Bollaert, engineer, Westinghouse Electric Corp., San Francisco.

Without exception, each speaker held the alert interest of the audience and each one was as finished in his delivery as he was well-informed on his chosen subject. In other words, there were no bobbing heads in that audience throughout three and one-half hours of continuous discussion, allowing for only a ten-minute intermission. Maybe that can be put down as something of a record, too.

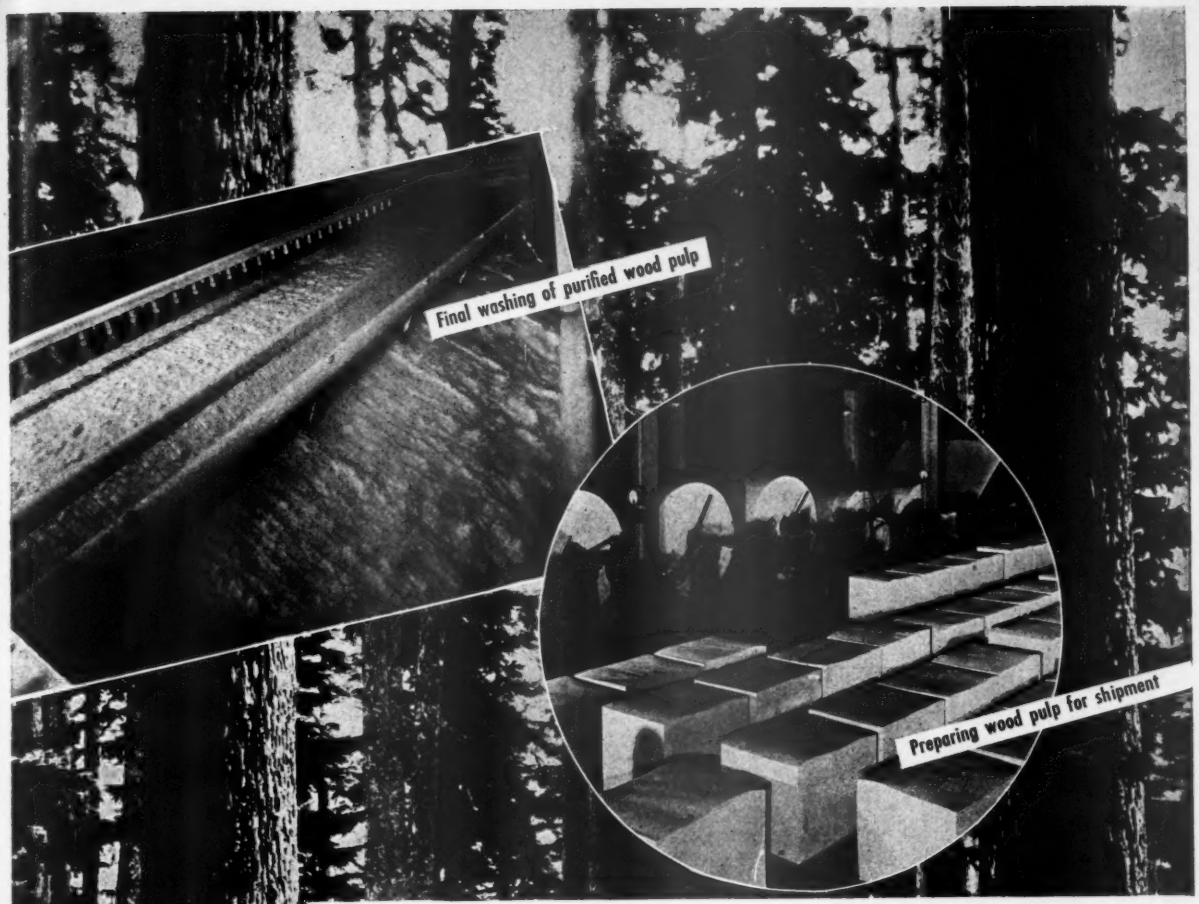
Mr. Hyde summarized the applications of resins in various phases of papermaking from the point of view of mills, both in research and in actual successful operation. He spoke particularly from the point of view of a large paper company which already is making several uses of resins and is interested in other promising applications.

Mr. Norton, who confined his review to the pulp molding process, went into specific matters of costs and he showed quite a number of products made by the Keyes Fibre Co. of Waterville, Maine, and the Hawley Products Co. of St. Charles, Ill., which he termed the "two outstanding leaders" in this field.

These exhibits ranged from egg cartons and pie plates—"old fashioned molding with no resins used—to a radio cabinet, a loudspeaker horn, valve wheels for destroyers, etc.—some of them molded under high pressure and with high resin surface content.

Mr. Redfern's talk dealt in part with the rapidly increasing trend into the use of resin-treated paper of pulp "overlays" in plywood. This

At Seattle TAPPI (left to right): Lieut. N. F. Harrington, U.S.N., stationed at Naval Hospital, Seattle, and formerly with New York Testing Laboratory in lower Manhattan, N. Y.C.; Ed Barrett, A. O. Smith Corp.; H. A. Rose, application engineer, Westinghouse Electric Corp., who recently moved to Seattle from Pittsburgh; A. C. Silliman, chemist, Everett mill, Weyerhaeuser Tbr. Co.; Raymond S. Hatch, research director, Pulp Div., Weyerhaeuser Tbr. Co., and Mrs. Hatch.



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subject has been covered to a considerable extent in a number of recent articles in PULP & PAPER INDUSTRY, particularly the one on Harbor Plywood Corp.'s (Hoquiam, Wash.) Super-Harborite in the December 1944 issue (page 29) and the March 1944 issue (page 5). Mr. Redfern showed samples of Super-Harborite, also of the Kimberly-Clark overlays and other similar products.

As has been pointed out in this magazine, he said the overlays made a better plywood in appearance, strength, etc., than when the wood veneers alone are used and he stressed the importance of pulp and paper overlays since it is becoming increasingly difficult to obtain first quality veneers, available only from the large trees in the west.

He said on a weight basis that the cost of impregnated kraft paper or pulp is fairly close to the cost of plywood veneer. Also that up to 33,000 tons of pulp per year of overlay production is forecast.

Two Types of Resins

A friendly rivalry marked the next two discussions of the two types of resins—melamines and urea—by Mr. Youngchild and Mr. Wampner. Mr. Youngchild has had long association with pulp and paper mills, especially throughout the South, whereas Mr. Wampner's work has been in research and industry in general.

During a question period, they apparently were both in substantial agreement that the effect of the strength of paper on the aging of Ph was not affected if the Ph was kept above 5.5.

They were asked at which point in the papermaking process was it best to apply their resins. Mr. Youngchild said it was found that the melamines had the best results if applied at the headbox or as close to the wire as possible. In the beater, he said, it appeared that agitation might disturb attachment of resins to stock.

Mr. Wampner said that it had been reported to him that in the Mid-West paper mills, where much waterleaf and similar types of paper are made, the resins were being added in beaters provided the temperatures are down. But he agreed that the proper place for adding resins probably was chiefly dependent on the kind of paper being made.

The sixth talk, by Mr. Remi Bollaert, dealt with possible uses of high frequency electrical heating applications in bonding resin-treated paper or pulp and this paper will be published in a later issue of PULP & PAPER INDUSTRY, as will Mr. Graff's Shibley contest paper.

High Frequency Heating

Mr. Bollaert discussed the possible applications of di-electric heating, as he called it, to paper or pulp combinations or laminates and to plastic pre-forms containing wood filler or pulp filler, and high pressure bonding of micarta, formica, etc. He not only discussed the principles involved and controlling factors in determining how such heating should be used, but he brought a Westinghouse experimental di-electric heating machine with which he made several interesting demonstrations of bonding materials.

He concluded that high frequency heating is probably the most expensive of all methods, but the high cost in certain instances may be justified by better products, labor savings, etc. He said high frequency energy would cost from 8 cents per kilowatt hour for small equipment to 3½ cents for large equipment, even the latter price being considerably higher than more commonly used forms of electrical energy.

No way had been devised to use high frequency safely or successfully on moving material, as on paper machines. By its nature, it first heated and bonded in the middle strata of objects rather than the outer sides as in other methods of heating, which offered some obvious advantages.

The Dinner Meeting

The dinner at the Meany hotel, a few blocks off the campus, followed his talk and was presided over by Harold Bialkowsky, technical director, Everett, Wash., mill, Pulp Div., Weyerhaeuser Tmbr. Co. and chairman of the TAPPI section. Dr. H. K. Benson, head of the University chemistry and chemical engineering department, introduced Dean L. R. Guthrie, head of the Graduate School, and a psychology professor.

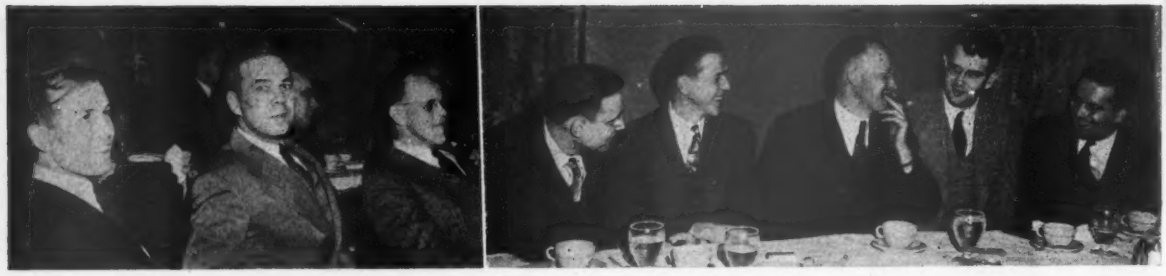
Dean Guthrie pursued in his discussion a theory of psychology that a great deal can be done to improve labor relations in the mills if more attention is given to "building up the role" of the individual employe—that is, his personal position and importance to the company. How he

BIG SUBJECT ROUNDED UP

WITH this issue we are able to complete for our readers one of the most interesting round table discussions ever held by the industry —on sulfite waste liquor (page 58).

The subject of sulfite waste liquor, its use or disposal, covered as it never has been done before in a TAPPI meeting, is presented in print in two sets of papers appearing in this issue and the November issue of PULP & PAPER INDUSTRY. Together, they form a complete reference report on that meeting which we hope will be of lasting value.

At Seattle TAPPI meeting (left to right): Victor J. Whitlock, sec.-treas., Clinton R. Lunde and L. S. Sheldahl, chem. eng., all three of Eagle Metals Co., Seattle; Dr. H. V. Tartar and Dr. J. L. McCarthy, Univ. of Wash., who conducted the technical session; Russell Graff and Carl Fahlstrom, both of Longview Fibre Co. Mr. Graff gave paper for Shibley award contest and he was accompanied to meeting by Mr. Fahlstrom, Assistant Mgr. of the Longview mill.



Here at TAPPI, Seattle meeting (left to right): William F. Abbott, Research Chemist, Puget Sound Pulp & Tbr. Co., Bellingham; Don Reed, Supt., Alcohol Plant, Puget Sound Pulp & Tbr. Co.; J. H. Solbakken, Central Engineering Dept., Crown Zellerbach Corp., Seattle; Dr. D. M. Ritter, ex-Du Pont, now with Pulp Mills Research, Univ. of Washington; Eric Ericcson, Tech. Director, Puget Sound Pulp & Tbr. Co.; Jim Hyde, Central Tech. Dept., Crown Zellerbach Corp., Camas, Wash.; Dr. Joseph McCarthy and Dr. R. W. Moulton, both of chemistry and chem. engineering staff, Univ. of Washington.

detailed this theory is dealt with in an article on page 24.

The committee in charge of the dinner was Dr. R. W. Moulton, associate professor, chemistry dept., and Dr. D. M. Ritter, who joined the pulp mills research program at the University last September, coming from the du Pont company of Delaware.

Attendance at the Dec. 4 TAPPI

William F. Abbott, Puget Sound Pulp & Timber Co., Bellingham, Wash.; Olavi Aho, Rayonier Incorporated, Hoquiam, Wash.; Fred Armbruster, The Dow Chemical Co., Seattle; Henry E. Backer, Soundview Pulp Co., Everett, Wash.; Chas. F. Bannan, Western Gear Works, Seattle; E. R. Barrett, A. O. Smith Corporation, Seattle; Glenn Bates, Westinghouse Electric Corp., Seattle; T. C. Baxter, Reichnold Chemicals, Seattle; Geo. H. Beisse, Pulp Division, Weyerhaeuser Timber Co., Longview, Wash.; H. K. Benson, Univ. of Washington, Seattle; W. Ronald Benson, Carl F. Miller & Co., Seattle; H. K. Berger, Everett Pulp & Paper Co., Everett.

H. W. Bialkowsky, Pulp Div., Weyerhaeuser Timber Co., Everett; Paul S. Billington, Pulp Division, Weyerhaeuser Timber Co., Longview; John J. Bogner, Casein Co. of America, Seattle; R. Bollaert, Westinghouse Electric Corp., San Francisco; A. A. Bulen, Westinghouse Electric Corp., Seattle; Allen M. Cadigan, St. Regis Paper Co., Kraft Pulp Div., Tacoma; R. E. Chase, R. E. Chase & Co., Tacoma; E. Christoferson, Soundview Pulp Co., Everett; Dwayne J. Clark, Everett Pulp & Paper Co., Everett; Sidney M. Collier, Puget Sound Pulp & Timber Co., Bellingham; J. J. Connors, Washington Veneer Co., Olympia, Wash.

N. W. Coster, Soundview Pulp Co., Everett; J. V. B. Cox, Hercules Powder Co., Portland, Ore.; Thomas V. Dick, The Dicalite Co., Seattle; Porter T. Dickie, Crown Zellerbach Corp., Port Angeles, Wash.; R. E. Draper, Pulp Div., Weyerhaeuser Timber Co., Everett; E. O. Ericsson, Puget Sound Pulp & Timber Co., Bellingham; W. H. Eunson, Westinghouse Electric Corporation, Seattle; Carl Fahlstrom, Longview Fibre Company, Longview; Harris B Fenn, Jr., National Aniline Division, Portland; Irving R. Gard, Merrick Scale Mfg. Co., Seattle; J. E. Garrison, American Cyanamid Co., Seattle; A. S. Gerry, Pulp Division, Weyerhaeuser Timber Co., Everett; M. E. Geteendaner, Univ. of Washington, Pulp Mills Research Project, Seattle.

Russell Graff, Longview Fibre Co., Longview; Harold G. Griep, Pulp Division, Weyerhaeuser Timber Co., Everett; R. V. Harkema, Zellerbach Paper Co., Seattle; Lt. (j. g.) N. Harrington, USNR, USN Hospital, Seattle; R. S. Hatch, Weyerhaeuser Timber Co., Longview, and Mrs. Hatch; S. Hazelquist, Pulp Div., Weyerhaeuser Timber Co., Longview; T. S. Hodgins, Reichhold Chemicals, Seattle; W. F. Holzer, Central Tech. Dept., Crown Zellerbach Corp, Camas, Wash.

A. H. Hooker, Hooker Electrochemical Co., Tacoma; J. B. Hyde, Central Tech. Dept., Crown Zellerbach Corp., Camas; B. L. Kerns, Westinghouse Electric Corp., Seattle; A. H. Lundberg, Seattle; Clinton R. Lundy, Eagle Metals Co., Seattle; Joseph L. McCarthy, Univ. of Washington, Seattle; W. C. Marshall, Pacific Coast Supply Co., Portland; John G. Meiler, Plywood Research Foundation, Tacoma; Ned Menzies, Tyler Co., Seattle; Murl Miller, Soundview Pulp Co., Everett.

R. W. Moulton, Univ. of Washington, Seattle; E. T. Naden, Westinghouse Electric Corp. Seattle; Arthur J. Norton, Seattle; Clifford H. Pearson, Washington Veneer Co., Olympia; D. E. Pennington, Pulp Mills Research Project, Univ. of Washington, Seattle; George I. Petelin, Griffith Rubber Mills, Portland; Robert R. Pierce, Penn. Salt Mfg. Co. of Wash., Tacoma; Donald V. Redfern, Adhesive Products Co., Seattle; Donald L. Reed, Puget Sound Pulp & Timber Co., Bellingham; Everett Reichman, Simpson Logging Co., Shelton, Wash.; E. D. Rich, Cellulose Products Co., Tacoma; D. M. Ritter, Univ. of Wash., Seattle.

Oliver E. Ronken, Soundview Pulp Co., Everett; H. A. Rose, Westinghouse Electric Corp., Seattle; Walter A. Salmonson, Simonds Worden White Co., Seattle; Otto H. Sangder, Rayonier Incorporated, Hoquiam, Wash.; J. M. Shedd, Everett Pulp & Paper Co., Everett; L. R. Sheldahl, International Nickel Co., Eagle Metals Co., Seattle; Brian Shera, Pennsylvania Salt Mfg. Co. of Wash., Tacoma; Arlo C. Silliman, Weyerhaeuser Timber Co., Everett; Sidney Silverstone, Soundview Pulp Co., Everett; J. F. Smith, The Dow Chemical Co., San Francisco; Lawrence K. Smith, Pulp & Paper Industry, Seattle; M. F. Smith, Simpson Logging Co., Shelton; J. H. Solbakken, Crown Zellerbach Corp., Seattle; H. V. Tartar, Univ. of Washington, Seattle.

R. M. True, General Dyestuff Corp., Portland; R. O. Vognild, Hooker Electrochemical So., Tacoma; Jonathan B. Ward, Hooker Electrochemical Co., Tacoma; A. T. Walton, Simpson Logging Co., Shelton, Wash.; C. L. Walton, Puly Div., Weyerhaeuser Timber Co., Longview; H. L. Wampner, Reichhold Chemicals, San Francisco; L. H. Wear, Taylor Instrument Co., Portland; Victor J. Whetlock, Eagle Metals, Seattle; Peter M. Willkie, Crown Zellerbach Corp., Camas; Albert Wilson, Pulp & Paper Industry, Seattle; Z. A. Wise, Griffith Rubber Mills, Portland; R. H. Young, Cellulose Products Co., Tacoma; K. E. Youngchild, American Cyanamid & Chemical Corp., New York, and A. C. R. Yuill, Dominion Engineering Co., Vancouver, B. C.

Dick Wollenberg Back at Longview Fibre

Lt. Col. Dick Wollenberg (U. S. Army Air Forces), recently resumed his connection with Longview Fibre Company, Longview, Wash., after approximately four and one half years in the service. He is an engineer.

Andrews Safety Engineer

Bob Andrews has become safety engineer at Longview Fibre Co., Longview, Wash., succeeding Joe Fotheringill, who resigned.

Peace, It's Wonderful

The Coos Bay Pulp Corp., Empire, Ore., a Scott subsidiary, has been loading paper pulp on the SS. Billings Victory, sailing under the flag of the States Steamship Lines, for the Atlantic coast.

Failing Tours East

W. L. Failing, Assistant Manager of Fir-Tex Insulating Board Co., St. Helens, Ore., returned on Dec. 10 from a 10-week trip East, with a southern routing back through California centers.

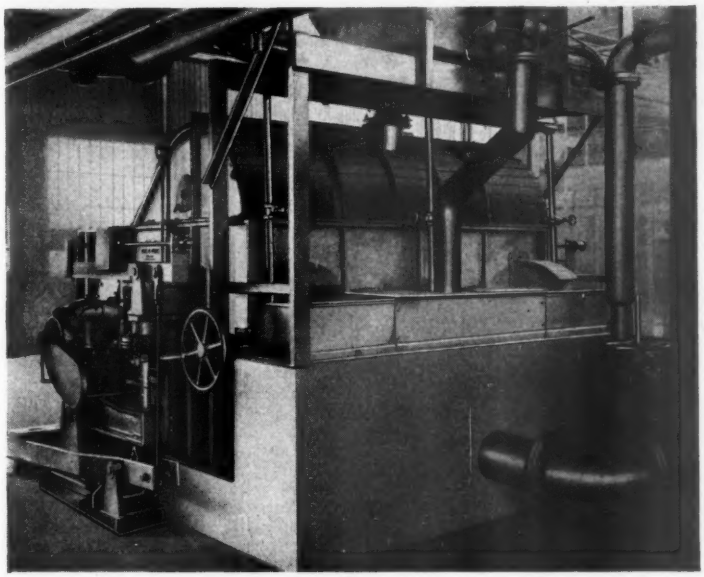
Senior Research Chemist

Dr. William W. Marteny, for 4½ years with Northwest Paper Co., Cloquet, Minn., as assistant manager, Technical Service Department, has come to Camas, Wash., as Senior Research Chemist, Experimental pulping division of Fiberous Raw Material Dept., Central Technical Laboratory of Crown Zellerbach Corp. Dr. Marteny, with a B.S. from University of Arizona, 1936, and an M.S. from the same institution, 1937, was graduated from the Institute of Paper Chemistry, Appleton, Wis., with his Ph.D in 1941.

Pulpwood Ceilings Raised

The O. P. A. has allowed a $1-$2 increase in pulpwood prices in Michigan, Wisconsin and Minnesota.

The ROLL-O-FINER



Typical installation view of Roll-O-Finer in U. S. Mill

Positive fibre treatment by a continuous recycling of stock.

Positive control of roll pressure.

Handles free stock at high consistency.

Production rate determined by treatment required.

Basalt Lava stone treatment ideal for high strength development.

Suitable for treatment of fibre for insulating board stock.

Especially adapted for treatment of screenings.

Design provides for low submergence load with resultant low H. P.

Bedplate accessibility.

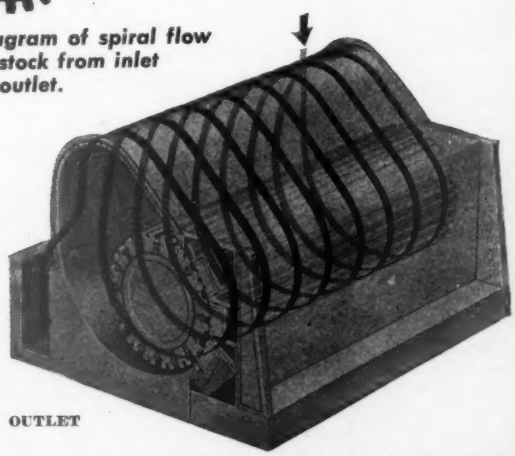
Furnished in single or multiple units in series.

Compact, rugged construction.

Size or refiner roll: 48 inches diameter x 96 inch face.

Ask for Roll-O-Finer Bulletin

Diagram of spiral flow of stock from inlet to outlet.



U. S. Patent No. 2,360,854 — Mexico 43,184. Canada, Great Britain and Sweden pending.

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Rutledge Retires As Sutherland President

Robert E. Rutledge has announced his resignation as president of the Sutherland Paper Co., Kalamazoo, Mich., a post he has held since Feb. 1942.

The resignation is to be effective Dec. 31. Mr. Rutledge joined Sutherland in 1928 as salesman, after a year and a half with the Mac-Sim-Bar Paper Co. He became sales manager in 1932, was elected vice president in 1935, and became executive vice president in 1940. He was made president two years later when L. W. Sutherland became chairman.

Koplik Celebratees

Abner Koplik, vice president of Castle & Overton, Inc., 530 Fifth Ave., New York, papermaking supply company, has had two recent events to celebrate — his 50th year with the company and birth of a sixth grandchild.

Harold Cavin Returns To Bellingham

Commander Harold D. Cavin, U.S.N.R., spent most of the past month at his home in the Geneva suburb of Bellingham, Wash., on Lake Whatcom, resting up after his three years in the Seabees.

Much of that time he spent in the South and Central Pacific as commander of the Seabees' 100th Battalion. His wife, Pauline, stayed with her family in Tacoma, Wash.

Commdr. Cavin, who was associated in construction of some of the biggest pulp mills in the West and South, planned to return to his position as resident engineer, Puget Sound Pulp & Timber Co.

Starr Joins Cellulose Sales Co.

N. R. Johaneson, president of Cellulose Sales Co., 250 Park Ave., New York, announces that Harrison (Harry) Starr has joined the sales staff.

Mr. Starr for 16 months has been with OPA's Paper and Paper Products Branch, as head of the Raw Materials Section. He was for years connected with the sales staff of Brown Co., Berlin, N. H., and later with Atterbury Brothers and Price & Pierce, Ltd., in New York.

Leek Is Appointed

Thomas Leek has been appointed vice-president and sales manager, Whiting Plover Paper Co., Stevens Point, Wis.

Sutherland's Sons Still in Service

Pending the return of his two sons, still in the armed services, D. Manson Sutherland, president of Sutherland Refiner Corp., Broad St. Bk. Bldg., Trenton, N. J., is finding himself so busy taking care of the company affairs on this continent that he has delayed renewal of the company services in England and Europe.

Coast Superintendents

(Continued from Page 33)

in connection with the convention, including a well-attended dance the final night, dances on both nights, bowling, golf and a "Wake 'Em Up" breakfast where a fine program of entertainment was provided with Zana Wise as chairman. Doug Morris handled reservations; Walt Salmonson, arrangements, and Gerald Alcorn arranged the program.

Convention Registration

The order of registration (134 were registered and about 45 were accompanied by their wives):

Irving R. Gard, Merrick Scale Mfg. Co.; J. F. Smith, Dow Chemical Co.; Hugh Mount, Hill-Mount Co.; Frederick E. Alsop, Hill-Mount Co.; T. H. Beaune, Fibreboard Products, Inc., Port Angeles Div.; W. R. Monette, Dicaljte Co.; T. V. Dick, Dicalite Co.; John Guthrie, British Columbia Pulp & Paper Co.; L. R. Wood, Rayonier Incorporated, Grays Harbor Div.; G. A. Frogner, Consulting Engineer; H. M. Jones, Ohio Knife Co.; Glen Phillips, Pioneer Flintkote Co., Los Angeles; M. Shanahan, Shanahan Ltd.; L. W. Pumphrey, Westminster Paper Co.; Fred L. Epler, Westminster Paper Co.; Fred Armbruster, Dow Chemical Co.; Doug Morris, James Brinkley Co.

J. V. B. Cox, Hercules Powder Co.; H. R. Heuer, Pulp Div., Longview Mill, Weyerhaeuser Timber Co.; Halvar Lundberg, A. H. Lundberg Co.; A. S. Quinn, Steggins Engineering Corp.; Albert Wilson, Pulp & Paper Industry; L. R. Hartman, Pulp Div., Everett Mill, Weyerhaeuser Timber Co.; A. F. Benson, Fibreboard Products, Inc., Port Angeles Div.; E. J. Colbert, Western Gear Works; R. M. True, General Dye Corp.; J. R. Lewis, Coos Bay Pulp Corp., Anacortes Div.; J. L. Janecek, Inland Empire Paper Co.; C. M. Barr, Marshall & Barr; W. S. Salmonson, Simonds-Worden-White Co.; V. H. Vorda, Griffith Rubber Mills; C. F. Bannon, Western Gear Works.

W. W. Clarke, Longview Fibre Co.; C. R. Storaaslie, F. D. Honey and T. B. Horn, Corn Products Sales Co.; H. B. Fenn, Jr., National Aniline Div. of Allied Chem. Corp.; F. Gilmore, Puget Sound Pulp & Timber Co.; Ray Smythe, Rice Barton Corp.; R. K. Pratt, West Linn Div., Crown Zellerbach Corp.; D. E. McMahon, West Linn Div., Crown Zellerbach Corp.; J. H. Quigley, Port Townsend Div., Crown Zellerbach Corp.; R. M. Hendrick, Tacoma Plumbing Supply Co.; R. R. Cox, Walworth Co.; R. W. Stephens, West Coast Paper Board Mills, Los Angeles; L. H. Wear, Taylor Instrument Companies; J. M. Ruck, St. Regis Paper Co., Kraft Div.; R. T. Kidde, Hills McCanna Co.; A. S. Viger, Simpson Logging Co.; W. A. Simpson, Hills McCanna Co.; F. B. Steig, Titanium Pigment Co.; H. R. Russell, Everett Pulp & Paper Co.

J. Martin, Schorn Paint Mfg. Co.; L. F. Wray, Simonds Saw & Steel Co.; H. N. Danielsen, Simonds Saw & Steel Co.; J. G. O'Brien, Soundview Pulp Co.; E. A. Weber, Oregon Pulp & Paper Co.; D. B. Armstrong, Oregon Pulp & Paper Co.; G. R. Cranor, Oregon Pulp & Paper Co.; G. R. K. Moorhead, Oregon Pulp & Paper Co.; N. Menzies, W. S. Tyler Co.; C. E. Ackley, Lebanon Div., Crown Zellerbach Corp.; A. Gustin, Grays Harbor Div., Rayonier Incorporated; Lauren LaFond, Lebanon Div., Crown Zellerbach Corp.; F. V. Sams, Allis-Chalmers Mfg. Co.; V. E. Sandelin, Allis-Chalmers Mfg. Co.; R. T. Petrie, Black-Clawson Co.; J. C. Mannion, Grays Harbor Div., Rayonier Incorporated.

A. C. McCorry, St. Regis Paper Co., Kraft Div.; Dr. E. Locke, Dr. J. A. Hall and H. J. Andrews, U. S. Forest Service; J. A. Hawkesworth, Graton & Knight Co.; W. Colella, Graton & Knight Co.; F. W. McKenzie, Pulp Bleaching Co.; Tyler W. Sprake, Chemical-Proof Const., Inc.; H. B. Gerber, Williams-Gray Co.; W. A. Kelly, The Waterbury Felt Co.; Merrill Norwood, St. Helens Pulp & Paper Co.; Chester A. Fee, Pulp & Paper Industry; Lawrence K. Smith, Pulp & Paper Industry; E. R. Johnson, Contractor; Brain L. Shera, Pennsylvania Salt Mfg. Co. of Wash.; E. G. Drew, E. G. Drew Co.; J. A. Paget, Peacock Bros., Ltd., Vancouver, B. C.; E. O. Ericsson, Puget Sound Pulp & Timber Co.; J. P. Strasser, Stein-Hall & Co., Inc., New York; S. A. Salmonson, Soundview Pulp Co.; Ray Salmonson, Soundview Pulp Co.; Norman Heglund, Soundview Pulp Co.

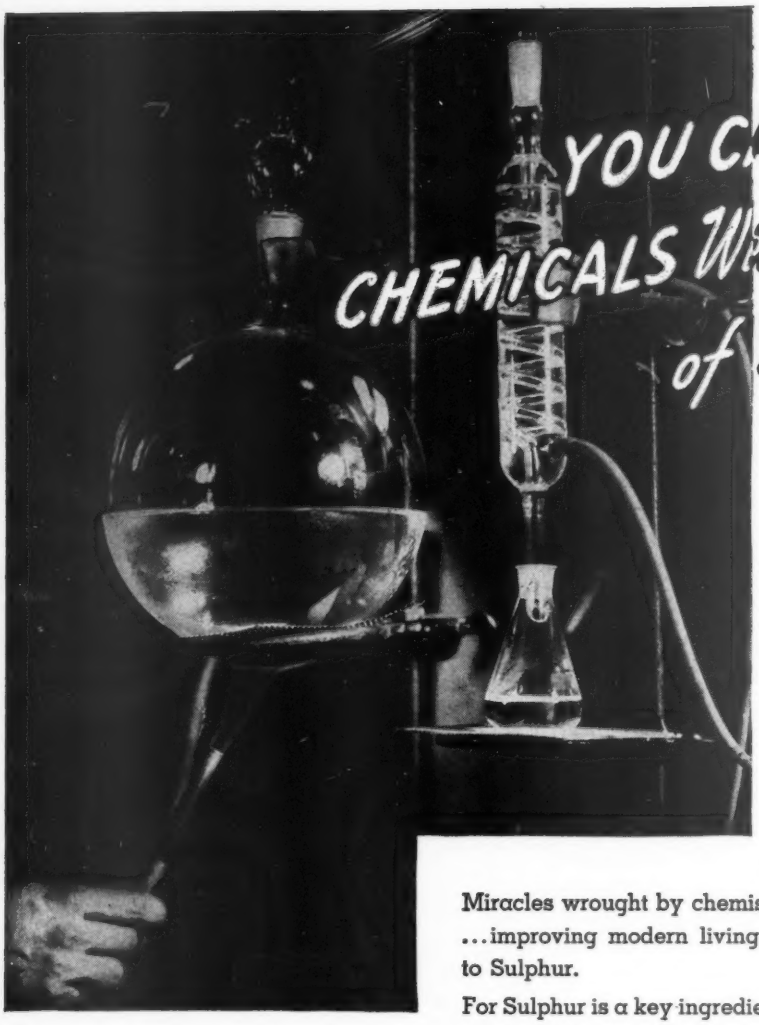
N. W. Coster, Soundview Pulp Co.; Z. A. Wise, Griffith Rubber Mills; George A. Holt, Grays Harbor Div., Rayonier Incorporated; R. O. Vognild, Hooker Electrochemical Co.; J. B. Ward, Hooker Electrochemical Co.; C. B. Baxter, Tacoma Plumbing Co.; Fred Wellington, Western Gear Works; J. H. McCarthy, Soundview Pulp Co.; Firman Flohr, Flohr & Co.; A. C. Dunham, Lockport Felt Co.; W. H. Kasch, Pulp Div., Weyerhaeuser Timber Co.; H. C. Ricker, Pulp Div., Weyerhaeuser Timber Co.

O. E. Fox, Pulp Div., Everett mill, Weyerhaeuser Timber Co.; R. A. Johnson, Pulp Div., Everett mill, Weyerhaeuser Timber Co.; H. N. Simpson, Cellulose Engineers; C. R. Lundy, Eagle Metals Co.; R. H. Raymond, Eagle Metals Co.; R. V. Bingham, Bingham Pump Co.; E. A. Heiss, Wallace & Tiernan Co.; Paul Olson, Sicony-Vacuum Oil Co.; H. H. Proseus, Johns-Manville Co.; R. M. Cooper, Powell River Co.; R. C. Bledsoe, Powell River Co.; Carl Ramstad, Soundview Pulp Co.; John M. Carlson, Soundview Pulp Co.; R. W. Simeral, Fir-Tex Insulating Board Co.; B. L. Kerns, Westinghouse Electric Corp.; E. E. Matson, U. S. Forest Service.

C. R. Huick, Johns-Manville Corp.; L. D. McGlothlin, Camas Div., Crown Zellerbach Corp.; S. O. Sather, Socony-Vacuum Oil Co.; James F. Brinkley, James Brinkley Co.; C. F. Trombley, Monsanto Chemical Co.; Harold Wall, Longview Fibre Co.; M. J. Hodson, Soundview Pulp Co.; N. D. Galteland, Instruments Supply Co.; Dan J. Keating, Stauffer Chemical Co.; J. H. Moak, Soundview Pulp Co.; Lester M. Johnson, Pulp Div., Everett Mill, Weyerhaeuser Timber Co.; O. K. Chapman, Pulp Div., Everett Mill, Weyerhaeuser Timber Co.; Wm. J. F. Francis, Pennsylvania Salt Mfg. Co. of Washington.

Bill Herbs Lose Infant

Friends of Francis 'Bill" Herb, vice president and manager of the Pacific Coast Paper Mills in Bellingham, were sorry to learn of the death of the Herb's infant son, Paul John Herb, on Dec. 6. The infant passed away at birth in Saint Joseph's Hospital in Bellingham.



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EXPLOSIVES	PETROLEUM PRODUCTS
FABRICS	PLASTICS
FERTILIZERS	PROCESSED FOODS
FILM	REFINED METALS
FOOD PRESERVATIVES	REFRIGERANTS
FUMIGANTS	RESINS
FUNGICIDES	RUBBER
GASOLINE	SYNTHETIC RUBBER
GLASS	SOAP
GLUE	SODA
GLYCERIN	SOLVENTS
INSECTICIDES	STEEL
KEROSENE	SUGAR
LEATHER	TEXTILES

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USE OF RESINS IN PULP AND PAPER

By J. B. Hyde

Research Chemist, Central Tech. Dept., Crown Zellerbach Corp., Camas, Wash.
(Paper presented at TAPPI meeting, Dec. 4, Seattle, Wash.)

When we think of resins in paper, it is apt to be of sizing, but we are going to discuss the use of synthetic resins in pulp and paper for other purposes. Synthetic resins, and plastics, are magic words which fire the imagination. They create the desire to apply all the beauty and utility of synthetic resins to many forms of paper products. Some of this imagination is the result of too much publicity, but nevertheless, there are many applications of synthetic resins to paper which have already been proven practical for many years. Synthetic resins are now being used extensively for coating and impregnating of paper. New uses are being developed regularly and undoubtedly there will be many other uses in time to come.

Due to the inherent good strength properties of paper and pulp fibers, it is often of advantage to produce a thin film of a synthetic resin as a coating on paper, or to laminate a resin film to paper for added film strength. Many new thermoplastic resins are now obtainable in film form. These are expensive and, in some cases, lacking in the necessary ruggedness of strength. This strength is supplied by the use of paper. Also, strength values of thermosetting resins are increased many times by including fibers as a part of the final product.

Synthetic resins are easily combined with paper, either by coating, by laminating or by impregnating the paper fibers. The properties which are obtained are as follows:

COATING

1. Heat seal
2. Appearance—high gloss
3. Resistance to:
   - Moisture vapor
   - Water
   - Marring
   - Dust and germs (better sanitation)
   - Oils and greases
   - Gases
   - Low and high temperatures (of the coating)
   - Solvents
   - Acids and alkalis
   - Electric current
4. Pressure sensitive adhesion

For many uses such as food products it is essential that the resin be non-toxic and free from odor.

JAMES B. HYDE, Research Chemist, Central Tech. Dept., Crown Zellerbach Corp., who presented paper on uses of resins at Coast TAPPI session on University of Washington campus.

Not all the above properties can be met by any one type of resin, but all are met by proper selection of some particular resin for the specific properties desired for a certain use.

Coating with synthetic resins is done by:

1. Solvent method
2. Hotmelt method

Solvent Method

The solvent method consists of making a solution of the resin, plus suitable plasticizing, moistureproofing and other modifying materials and applying the solution by means of roll or knife coaters. These coaters include a drying tunnel to evaporate the solvent, leaving a clear, glossy, hard film on the paper. This drying is done by supporting a web, either horizontally or vertically, so that there is no contact with any surface which would mar the film used for coating. This is done on horizontal coaters by supporting the paper web on rolls at the two ends of the machine and using air jets in between to keep the web from sagging. The last roll is a chilling roll to cool the sheet and allow rewinding of the web. On vertical coaters the web can be suspended free of any contact during drying.

Solvent coating is more economical if volume of production is sufficient to permit the investment necessary for solvent recovery. Some of the solvents used are high in price and represent a considerable part of the cost of application. All of the resins listed can be applied from solvent, some better than others as regards production of a good film.

Hotmelt Method

Most waxes and many of the natural resins are relatively fluid at their melting temperature and can be used instead of solvents to produce a fluid hotmelt at elevated temperatures. If synthetic resins are combined with these materials, hotmelts are obtained which are sufficiently fluid at reasonably low temperatures (200 to 250 deg. F.) so that they can be applied in a comparatively thin film to paper. It is often necessary to couple the synthetic resin with the waxes. The abietic acid resin derivatives are helpful in many cases for coupling, and also serve to reduce viscosity.

Instead of being evaporated, as is the case with solvents, the waxes and natural resins solidify with the synthetic resin upon cooling. This eliminates the problem and cost of solvent evaporation, but introduces the problem of applying high viscosity hotmelts and introduces a compromise of the properties of the synthetic resins used. Too much dilution of the synthetic resin may impair or destroy gloss, abrasion resistance, toughness or heat sealing properties. Generally the hotmelt method produces a cheaper per pound cost of material applied but this may be offset by a greater amount of coating necessary to obtain a proper film.

One of the greatest difficulties in hotmelt coating is the lack of coating equipment which will adequately coat a thin film of viscous material on both sides of the sheet and produce a proper high finish. Equipment for coating consists of roll coaters, knife coaters and rotogravure coaters. The first two are not very satisfactory for materials above 3,000 centipoises viscosity. The rotogravure method offers good metering, but present smoothing equipment requires slow speeds and is not applicable to two side coating.

In both solvent coating and hotmelt coating, resin cost is much higher than paper cost per pound. So it generally pays to use the base stock of highest possible smoothness and also one which will absorb the

Synthetic Resin Coatings for Paper

RESIN	HOW APPLIED	MAIN PROPERTIES							PRINCIPAL USES ON PAPER
				Resistance To					
		Heat Seal	Gloss	Moisture Vapor Transmission	Water	Abrasion	Oil and Grease	Miscellaneous	
Acrylic	Organic solvent—hotmelt	Good	Good	Poor	Good	Good	Fair	Acid—Alkali	Water, acid, alkali protective papers.
Cellulose acetate	Organic solvent—film	Good	High	Poor	Good	Good	Exc.	Good electrical	Decorative—Lamp Shades—Grease resistant papers.
Cellulose nitrate	Organic solvent—film	Good	High	Good*	Good	Good	Good	Gasoline	Artificial leather—wall covering—labels—decorative and protective wrappings.
Chlorinated rubber	Organic solvent	Good	Good	Good	Good	Good	Poor	Poor for strong organic acids.	Inks—soap wrap coatings.
Cyclized rubber	Organic solvent—hotmelt	Good	Fair	Good	Good	Good	Poor	Acid—alkali—chemicals—(oxidizes)	Protective wrappings.
Ethyl cellulose	Organic solvent-hotmelt-film	Exc.	High	Poor	Good	Good	Fair	Alkali—low temperature—tough.	Decorative—protective wrappers—soap wrap—labels—laminating agent.
Methyl cellulose	Water	None	Poor	Poor	Good	Good	Exc.		Surface sizing to prevent penetration inks and waxes—grease resistant coatings.
Polyamide	Organic solvent—hotmelt	Good	High	Good	Good	Good	Exc.	Fair electrical properties—Good low temperature.	Protective wrappings—grease resistant coatings—laminating agent.
Polybutene	Organic solvent—hotmelt	Exc.	Poor	Good	Good	Poor	Good	Acid—alkali—alcohol—low temperature	Protective wrappers—laminating agent—adhesive.
Polyethylene	Organic solvent—hotmelt	Good	Fair	Good	Good	Good	Poor	Good electrical—inert—tough.	Newer resin of good promise for protective wrapping.
Polystyrene	Organic solvent-hotmelt-film	Good	High	Fair	Good	Good	Good	Good electrical—acid—alkali—alcohol	Promising, if flexibility and adhesion improved, for chemically resistant wrappings.
Polyvinyl alcohol	Water	None	Fair	Poor	Poor	Good	Exc.	Oxygen and CO_2—alcohol—gasoline	Wet strength—greaseproof wrappings.
Polyvinyl Butyral	Organic solvent—film	Good	Good	Poor	Good	Good	Exc.	Gasoline—good electrical—gases	Adhesive—Tarpaulins.
Polyvinyl (Copolymer)	Organic solvent—film	Exc.	High	Good*	Good	Good	Exc.	Acid—alkali—alcohol—low temperature	Label overprint—adhesives—protective wrapping—cap liners—phonograph records, book covers.
Polyvinylidene chloride	Film—hot solvent	Good	Good	Good	Good	Good	Exc.	Low temperature	Promising, if adhesion to paper and flexibility improved.
Rubber	Organic solvent—hotmelt	Exc.	Poor	Good	Good	Good	Poor		Protective wrappings—pressure sensitive tape—heat seal labels—adhesives.
Urea formaldehyde	Mixed with oil modified alkyds.	Resistant to solvents, soaps, waxes, stains, abrasion, low temperature							Adhesives—floor coverings.
Melamine formaldehyde	Mixed with oil modified alkyds.	Resistant to solvents, soaps, waxes, stains, abrasion, low temperature							Floor coverings.

Synthetic Resins for Impregnation of Pulp or Paper

Phenol formaldehyde	Beater—treating machine—size press—Novak treater.	Good electrical, acid, alkali, water and abrasion resistance	Laminated paper plastics—plywood overlays—Pulp mouldings.
Melamine formaldehyde	Beater—Size Press—Fan pump.	Increases wet strength, dryfold and mullen.	Laminated paper plastics—wet strength wrappings—maps—bags.
Urea formaldehyde	Ditto	Increases wet strength.	Ditto.
Rubber	Beater—Novak	Toughness, water resistance	Shoe soles—artificial leather.

*With proper formulation.

least coating, of course, consistent with paper strength required for the job. Dampened and supercalendered papers, of the ordinary bleached sulphite or of the glassine variety are used in many cases. In others supercalendered coated papers are used.

PRODUCTS OBTAINED

The main products which are made from surface coatings of one or more of the resins include artificial leather, label overprints, adhesives for labels, decorative papers for fancy boxes, candy and all kinds of wrappings, wrappings which afford moisture protection, bottle cap liners, wall coverings, adhesives for cartons and paper generally, paper phonograph records, book covers, paper tarpaulins, soap wrappers, grease resistant paper board containers and liners, laminated papers, floor coverings, pressure sensitive tapes, etc.

LAMINATING

Many of the resins listed on chart with this article may be combined in sheet form with paper and those which have good sealing properties may be used for laminating two sheets of paper together.

A. Resin film to paper

1. All the properties listed under coating, except the film is thicker and provides greater protection. Paper supplies greater strength for handling. Sheets of many resins can be combined with paper to secure added strength. While this is expensive and detracts from transparency of the film when used by itself, it is often done to obtain highly protective wrappers, high gloss, and high strength. Lamination to paper is accomplished by
   a. Wax or other adhesives.
   b. By hot calendering, or
   c. By moistening with a solvent which partially dissolves the resin film and makes an adhesive of the surface of the film itself.

   If lamination is by wax, moistureproofness may be greatly increased.

B. Resin used to laminate two sheets of paper.

The properties obtained are as follows:

1. Resistance to:
   - Moisture vapor
   - Water
   - Dust and germs
   - Gases
   - Low and high temperatures
   - Solvents
   - Acids and alkalis
   - Electric current

Laminating two sheets of paper with a resin supplies a lower degree of resistance than does coating, due to less continuity of film. To offset this a greater amount of resin must be used. It is used mainly where film hardness is not obtainable along with other desired properties.

IMPREGNATING

The properties obtained are as follows:

1. Resistance to:
   - Abrasion
   - Water absorption
   - Flame
   - Electric current
   - Mold
2. Wet strength
3. Increased strength and stiffness ness
4. Hiding of plywood patches, checking and grain raising
5. Toughness

Impregnated papers and pulps offer another broad field of application of synthetic resins to paper. Although there has been some application to this field of resins of thermoplastic type, by far the largest application has been with resins of the thermosetting type. Impregnation is accomplished by obtaining intimate contact of the resin with the pulp or paper fiber. This is done by application in the beater, size press, fan pump or by a treating machine, similar to the solvent type coating machines previously described. These treating machines apply resins either from a water or alcohol solution. In addition, there is the wet-web method of impregnation known as the Novak process. This process takes advantage of the fact that it is easier to impregnate a sheet of paper before it is dried than it is afterward. This means that intimate contact of resin can be secured, regardless of basis weight. It also means that the resin can be applied economically at the paper machine.

From synthetic rubber emulsions used to impregnate pulp sheets as heavy as 50 points, we obtain very durable shoe soles and other artificial leather products of great toughness. Some of the synthetic rubber resins produce better emulsions and easier saturation than natural rubber latex.

Uses of impregnated paper or pulp include wet strength papers, laminated paper plastics in sheets, rods, tubes, and other molded shapes; durable pulp molded articles of all shapes, and the comparatively new application of impregnated face sheets for plywood. This last application produces a plywood overlay which gives the plywood assembly considerable added value, both as a structural and as a decorative material.

Hooker Electrochemical Wins Atomic Bomb Award

In recent ceremonies at the Hooker Electrochemical Co., Niagara Falls, N. Y., Map. Gen. Leslie H. Groves, commanding general, Manhattan Project, presented a "special award" Army-Navy E flag with three stars to employees of the company for their production of material for the atomic bomb.

This award, the second made by the government for workers on this project, paid tribute to the Hooker Electrochemical Co. for sustained performance that not only met government requirements but in many cases bettered estimates during a three-year period. Edwin R. Bartlett, president, accepted the award on behalf of the company.

W. H. Palm Appointed Asst. to Brompton Mgr.

W. H. Palm, sales manager of Brompton Pulp & Paper Co., operating pulp mills at Red Rock, Ont., and East Angus, Que., has been appointed assistant to the general manager, P. H. Scowen. He will continue as head of the sales department.

Youngchilds Reunited In British Columbia

Four Youngchild brothers — Cap, of Appleton, Wis., retired general manager of all International Paper Co. northern mills; William, of St. Regis Paper Co., Tacoma, Wash.; Ray, of Columbia River Paper Mills, Vancouver, Wash., and Archie, of Soundview Pulp Co., Everett, Wash.—had their first reunion in 15 years during the week before Christmas in Vancouver, B. C.

Cap's son, Ken Youngchild, of American Cyanamid Co., also was in the west this month.

Roy Johns, John Stauffer On Cross-Country Trip

Roy B. Johns, assistant vice president and manager, Freeport Sulphur Co., 122 E. 42nd, New York, and John Stauffer, of Los Angeles, vice president of Stauffer Chemical Co., traveled together from New York to Seattle and down the west coast during November.

Mr. Stauffer is son of the founder of his company and he had been east on business. On the coast, the trip included Stauffer plants.

Mr. Johns is planning to be in the Southern U. S. pulp and paper region in January.

Longfibre Bowlers

The Longfibre Bowling League, Longview Fibre Co., Longview, Wash., completes the first half of a split season Dec. 18, with a lively race for first honors underway three weeks before the finish. Top teams as of Nov. 24:

	Won	Lost	Pct.
Machine Room	27	17	.614
Pulp Mill	27	17	.614
Bag Plant	25	19	.568
Supervisors	24	20	.545

High team game—Bag Plant, 1036; High team series—Pulp Mill, 2985; High single game—A. Cloninger, Office, 282.

MELAMINE RESINS FOR WET STRENGTH PAPER

By K. E. Youngchild

Supervisor of Paper Specialties, American Cyanamid & Chemical Corp.
(Paper presented at TAPPI meeting in Seattle, Dec. 4, 1945)

The subject of wet strength paper has grown from one which could be covered in a few ambiguous sentences to one which would take considerable time to discuss in detail. I shall but briefly cover the type of wet strength treatments, but rather shall devote most of my time to a discussion on utilization of the changes in sheet properties gained through use of wet strength resins.

The story of the development of our PAREZ* 607 Resin, which is a melamine formaldehyde resin, is an interesting story in itself. It was found that by dissolving the resin in a dilute muriatic acid solution and allowing to stand, a hazy, blue liquid resulted which was colloidal in appearance. We found the ratio of muriatic acid to resin happened to be one mol of acid to one mol of resin. Oddly enough, this was practically the best ratio of acid to resin. Our subsequent work, however, has given us a new formula in which we use a molar ratio of approximately 8/10 mol of acid to one mol of resin. This change in formula hastens the formation of the colloid and gives greater life to the solution. This colloid which is a partially polymerized resin, has a positive charge and when introduced into a stock suspension it attaches itself very firmly to the negative fibres and is retained. Considerable study is being carried on by our laboratory on the fundamental aspects of resin bonding with the resins of this type. The particle size must be exceptionally small as evidenced by electron microscope observations.

Although the melamine resin process was developed primarily for wet strength papers, it was surprising to find that in addition to wet strength in paper, several additional properties were affected. The dry mullen and tensile values were improved considerably and although the dry tear dropped slightly, it was by no means to the same extent as in tub-sized papers. The folding endurance of the papers was improved as much as several hundred per cent in some cases. Where rosin size was used, its effectiveness was improved. This was true even though we found that the resin had little or no sizing effect in unsized papers.

*Parez is trademark designating resins produced by American Cyanamid & Chemical Corp. for use in paper industries.

Wet Strength Property

The wet strength property itself is probably most outstanding as the prime reason for using the resin. For example, take bag paper. At the present time, practically all potato bag papers have been wet strength treated. After bagging at the harvest centers they are shipped in heated refrigerator cars to consumer centers—at least this applies to shipments from Maine. Changes in temperature and humidity cause severe condensation in the cars and the bags become soaking wet. The old style bags would disintegrate under these conditions and so the turn to wet strength paper bags was natural. The wet strength paper bags now protect the shipments so that only minor loss occurs. Multi-wall bags are now being used with wet strength plies where scuff resistance is required. For this purpose only the outer ply or plies need be treated. Our own shipping bags for PAREZ 607 have been treated with the resin. During the war, considerable wet strength multi-wall bags were made for export shipments.

Recently, a rather spectacular test was arranged by Bemis Brothers Bag Co. Several multi-wall paper shipping sacks were each filled with 50 pounds of flour and launched a half a mile above Niagara Falls. They were carried by the current to the center of the "Horseshoe" and plummeted 167 feet to the treacherous waters below. Seven and a half hours later they were recovered intact and in condition to deliver contents in a standard commercial shipment. These bags were fabricated from kraft paper treated with melamine resin to provide high wet strength. Such an example shows vividly the improved usefulness of paper gained through the use of resin modification of those papers. A kraft tarpaulin paper was made from two sheets of wet strength paper laminated with asphalt. A considerable quantity of this tarpaulin was used for protective purposes during the war and peacetime use of this product has been predicted. The asphalt film protects well against moisture, but is of such low strength in itself that it must be amply protected against rupture. The wet strength paper providing high wet scuff resistance and improved dry strength makes these paper tarpaulins practical. In general, the bag and kraft paper outlets will certainly increase. The present method of spraying vegetables in stores suggests wet strength paper bags for carrying the produce home in a bag that will stay intact even though damp.

The use of wet strength toweling paper is very well established. In this instance, the wet strength feature is rather obvious, as it will prevent the fibers from disintegrating while drying the hands. An additional good quality is the wet bonding in preventing the fibers from pulling off against the whiskers on a man. This prevention of linting has found wide use in other directions. During the war considerable amount of lens wiping paper was manufactured. The lens paper resembles closely the soft disposable tissue, but with the added wet strength feature. This prevented linting of the tissue and so was utilized by the Navy for wiping lenses of searchlights, delicate instruments, etc. The modern facial tissue grades should be improved through the use of melamine resin.

The increasing popularity of home freezers or community freezers has brought another demand for a paper that will have high wet strength. Many concerns are making papers which are used extensively in the frozen food packaging field. These include such papers as inter-leaving papers for steaks and chops, which will separate the meat and, although it becomes very wet after thawing, the paper can be peeled off in one piece without objectionable tearing and sticking to the

STANDARD ENGINEERS NOTEBOOK

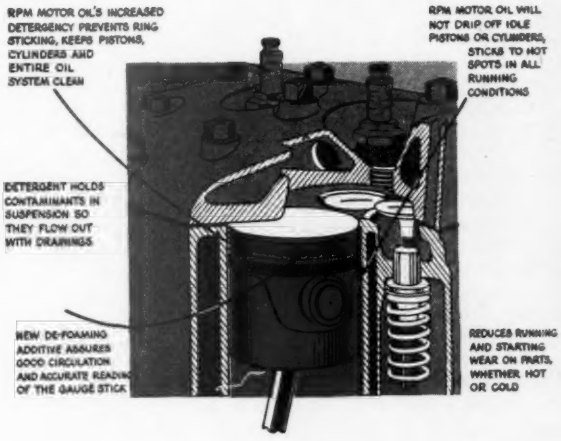
Improved RPM Motor Oil compounding reduces overhauls

Because of the lessening of military requirements for special ingredients used in heavy-duty lubricating oils, more compounding is now used in the manufacture of RPM Compounded Motor Oil. Operators using RPM Motor Oil will find engines running much cleaner and a marked reduction in wear on parts.

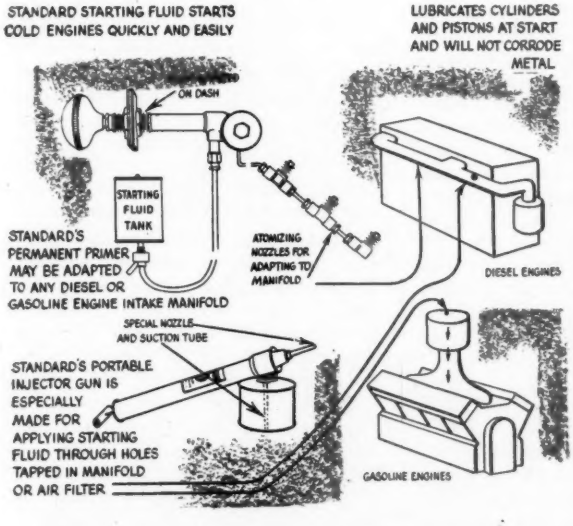
More detergent in RPM Motor Oil assures loosening of any gum-carbon deposits around rings, thus preventing sluggish action of rings, sticking and blow-by. Its washing action keeps cylinders, pistons and oil systems cleaner. It keeps contaminants dispersed in the oil until drained.

A new de-foaming compound has been added to RPM Motor Oil assuring full-flow oil circulation.

One hundred percent paraffin base RPM Compounded Motor Oil is improved in all of its old qualities including special affinity for metal whether hot or cold, resistance to oxidation and sludging, and prevention of corrosion on all engine parts.



Quick starts with cold engines in below-zero weather



In low temperatures, Standard Starting Fluid will save operators much time and trouble. It not only helps start engines almost at once when injected into fuel-mixing systems, but will keep them running until warm enough to operate on their regular fuel. It has started cold Diesels in temperatures as low as –50°F. and gasoline engines in temperatures as low as –40°F.

Standard Starting Fluid may be applied by a permanent primer pump mounted convenient to the operator and attached to atomizers installed in the engine manifold, or a portable spray gun used to inject the fluid through a hole in the manifold of a Diesel engine or the air filter of a gasoline engine. Both are available from Standard of California.

Standard Starting Fluid is easy to use. With the engine turning over, pump the primer or spray gun until the engine starts. Then diminish the spray volume until the engine is warmed up.

Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert help — make your maintenance job easier. Call your local Standard Representative or write Standard of California, 225 Bush St., San Francisco 20, California.

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meat. Wet strength glassine papers for packaging have been advertised in Modern Packaging magazine. Wet strength diaper papers have been placed on the market, and the need for wet strength in such papers hardly needs explanation.

There has been considerable interest recently in saturating papers which have been wet strength treated. The characteristics of paper can be changed by subsequent treatment, but we have been limited to converting operations in the past because of inability to apply enough modifying material at the size tub. Papers which have been rosin sized to allow them to travel through the size press do not absorb very much at the press. On the other hand, a long-fibered unsized saturating sheet can be made with melamine resin which will allow a great degree of pick-up at the size tub. The melamine resin will show a fair degree of wet strength at the size press on most machines. This will allow paper mills themselves to carry out modifying procedures which heretofore have been limited almost entirely to the converter.

Dry Strength Property

The added dry strength is of such importance that considerable study is now being made to determine whether or not hardwood fiber or a partial substitution of hardwood fiber might be used to make papers which will compete with soft wood grades and thus extend the soft wood supply. This is extremely important in the northeastern and north-central states where the soft wood supply is decreasing. Perhaps it is not yet an acute problem on the Pacific Coast. During the war considerable advantage was taken of this fact by increasing the groundwood content of wet strength sheets, reducing the chemical pulp furnish, and still having a sheet equal in strength to the former furnish.

The increase in folding endurance that is gained through the use of the resin has permitted mills to meet government fold specifications which would have been impossible without the use of the resins. These increases in dry strength have gained such importance that they seem almost to parallel the wet strength feature itself. The famous Army wet strength map paper which received such wide publicity and comment was an outstanding example of a high dry strength, high wet strength paper. I have heard considerable comment to the effect that the dry strength improvement was just about as important as the wet strength feature of the paper. A dry mullen and tensile increase of about 15 to 20% and a tremendous increase in folding endurance were gained only through the use of the resin. This high dry strength, high fold endurance paper, which took printing very well, is a great step forward in making papers which will find increased usefulness.

Another very large field which appears to be coming to the foreground makes an indirect use of wet strength resin. This is the field of printing papers where improved dimensional stability is desirable. Although we have had no evidence that the resin is directly responsible for improved stability, we do know that by making use of its properties we can obtain more dimensionally stable papers.

Charles G. Weber of the National Bureau of Standards in Washington, D. C., has written an article which appears in the Printing Equipment Engineer, August, 1945, entitled "Notes on Resin Bonded Wet Strength Papers." Mr. Weber points out that as shown in many of his earlier studies, the dimensional stability of the paper decreases as the degree of hydration increases. By utilizing the resin as a binder to replace part of the hydration gel binder we can produce a sheet which is fully as strong as a more hydrated sheet. The sheet with less hydration gel will show less tendency to expand or contract, with changes in atmospheric humidities. The Army map utilized this feature and it will be noted from examination of these sheets that the stock is relatively long fibered, with very high mullen, tensile, and fold even though it has not been highly hydrated. Increased hydration would have rendered it less dimensionally stable. It is quite obvious that when one uses the map for plotting distances, it must be the most stable type of paper possible. We believe that the investigation of this particular use has only started and that as further work is carried on, more and more printing grades will be made from longer fiber stocks which will still be strong and well formed and have the added quality of improved dimensional stability. We have long thought that such things as automatic cards which run through automatic sorting machines would be improved by utilizing this property which can be secured through use of the resin.

Other Benefits

The PULP AND PAPER INDUSTRY magazine which is undoubtedly familiar to most of you, carried an article on Melamine Wet Strength Resin in the October issue. It pointed out the benefits of a large coating mill derived from wet strength treated raw stock. Several stories from other printers to the effect that their printing operations and press room trouble are minimized by the use of wet strength paper stock have been received. Use of resin to minimize such troubles as cockle, wavy edges, breaks in subsequent coating operation, picking of the surface and to improve dry strength, are all of interest to the printer. Improved press room operation has value and should bring increased returns for such a paper.

In rosin-sized papers, water resistance is improved, especially in lightweight paper. In these days of extreme rosin shortage, it is quite possible that a limited number of papers would be able to utilize the melamine resin as an aid in sizing.

A word about the good points without a reference to some of the difficulties is perhaps not quite fair. The broke problem has long been held as the chief objection in many proposed applications of wet strength resin. (There is promise at the present time that an answer to this problem may be in sight. Final work has not been concluded on this development, but an early release is expected.) At the present time, most of those who are using wet strength paper are able to dispose of the broke by reworking it themselves in beaters under conditions of a pH of about 4 to 4.5 and temperatures over 180°F. All of the present known methods are covered quite well in several articles on the subject and in our bulletins covering the PAREZ 607 process. These are available upon request. New broke disposal methods are being investigated and several interesting leads are being developed.

A great many potential new outlets for improved papers through the use of resin treatment are coming up every day. New resins are being considered for wet strength treatment, as well as resins to modify other properties of the paper. I believe we may look forward to an increasing number of resin applications to paper. As many of these broaden the usefulness of the paper, they contribute very well to the paper industry as a whole and deserve an appreciable amount of time and study. The future looks so bright that we in the chemical industry are often prone to state that paper is the best carrier for chemicals that we know of.

WASTE SULFITE LIQUOR EVAPORATION IN SWEDEN

By Gustaf Edling

Vice President, Swedish Steam Boiler Users Assn., Stockholm
(Presented at TAPPI meeting. Camas, Wash., Oct. 9)

Beginning here and on the following pages are the papers presented by Drs. Shinn, Tousley and Stephenson and Mr. Edling at Pacific Coast TAPPI Round Table discussion of "Utilization and Disposal of Waste Sulfite Liquor," as presented at the Camas, Wash., meeting on Oct. 9.

These papers, combined with the material in the November issue of PULP & PAPER INDUSTRY, pages 32 to 48, present a complete report on that meeting.

These two sets of papers and the commentaries with them present, in toto, probably the most thoroughgoing discussion of sulfite waste liquor research ever made at an industry meeting.

It seems rather remarkable to me that, when speaking about waste sulfite liquor in this country, you always refer to problems in connection with the burning of the evaporated liquor whereas in Sweden up to now we have been interested mostly in problems regarding the evaporation of waste sulfite liquor.

In Sweden we have had so many problems with the evaporation of waste sulfite liquor that until rerecently we have devoted more time to solving that problem than to the burning of the liquor. As most of you probably know, there are some plants operating in Sweden for the evaporation of waste sulfite liquor. These plants are based mainly on two different systems: namely, Ramens and Rosenblads. A brief description of these two systems might be of interest to you.

Ramens System

The original Ramens system can be described as follows: Part of the combustion gases are bled from the furnace of a boiler at a temperature of about 2000°F or more. Sulfite liquor concentrated to a certain extent is sprayed into these gases and is thus dried to practically dry solids. The gases containing the dry solids are conveyed through a cyclone where nearly all the solids are separated from the gases. The dry solids are taken from the cyclone to a pulverizer and are blown direct from the pulverizer to the burners and are burnt in about the same way as pulverized coal. The temperature of the gases is brought down very quickly when liquor is added and in the cyclone it is kept at about 600°F. This temperature is automatically regulated by the variation of the quantity of liquor used.

In order to utilize the heat of the gases still further for the purpose of evaporation, liquor is sprayed into the gases after they have left the cyclone whereby a certain amount of dry solids is also recovered. When the gases have thus been in contact with the liquor for a second time, the temperature is normally reduced to a little more than 200°F. The gases containing the evaporated water from the liquor have a high dew point (and a high temperature as measured by a wet bulb thermometer) and are further utilized in a scrubber where most of the vapor is condensed by means of water circulated through the scrubber and a heat exchanger. Heat delivered from this circulating water in the heat exchanger is used for heating waste sulfite liquor. This liquor in turn is circulated through the heat exchanger and a flash evaporator which is kept under vacuum by a condenser.

The sulfite liquor which is to be evaporated enters the system more or less directly into the flash evaporator. Waste liquor to the second sprayer (the one located after the cyclone) is taken from the flash evaporator circulating system. The liquor to the first sprayer (the one before the cyclone) is taken from the second sprayer circulating system. By arranging the liquor contact to the gases in such a manner, a certain contra-flow system between the liquor and the gases is obtained, and as indicated from the description, some multiple effect (approximately 1½ effect) is obtained.

The above description refers to the original Ramens system. Naturally many variations thereof can be built in actual practice. It should be said that the concentration of the waste sulfite liquor entering the system should be at least 12% solids in order to obtain any fuel saving, but the concentration of the liquor entering can be increased by some kind of pre-evaporation and this is also being done. In the Ramens system, as now practiced, the liquor is dried to practically dry solids before it is blown into the furnace.

Rosenblads System

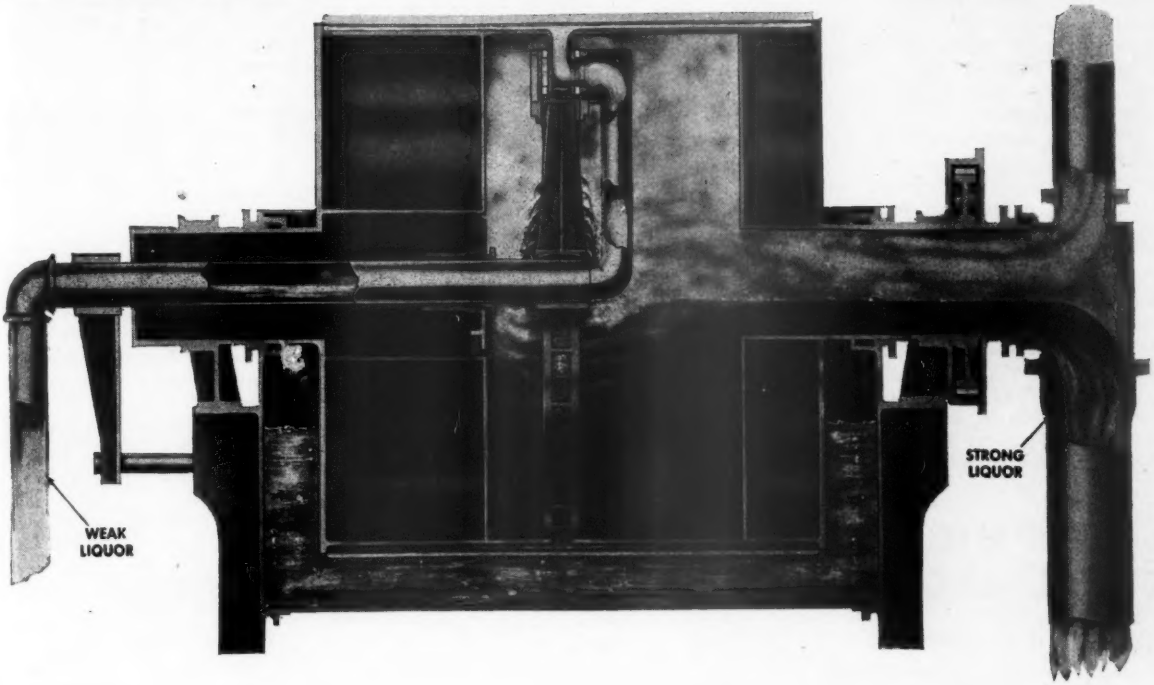
In the Rosenblads system, on the other hand, up to now the evaporation has not been carried through further than to 50%-60% solids and the liquor is sprayed into the furnace at that density.

The Rosenblads system for the evaporation of waste sulfite liquor is based on a multiple effect evaporation. The number of stages in this multiple effect and the general arrangements of the evaporation depends on if and in which way the evaporation plant can be combined with the steam consumers in the existing plant. In some cases it may be possible to arrange the evaporators so that the steam from the last stage can be utilized, for instance, for distilling purposes in the alcohol plant, necessitating the use of a high steam pressure in the first stage of the evaporation plant corresponding to the pressure drop in the evaporators. In other cases, when a lower steam pressure (and a lower temperature) in the first stage is considered advisable, the evaporation plant may be arranged to operate from a low steam pressure down to vacuum.

Probably one of the principal reasons why waste sulfite liquor was heretofore not evaporated was the difficulty in keeping the heating surface clean from scale. This applies to conditions where the calcium bisulfite process is used which is the case in the Swedish mills herein referred to.

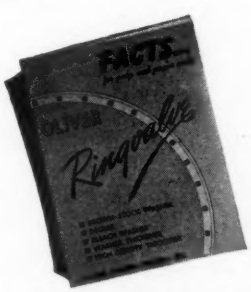
It has been found that the physical characteristics of the waste sulfite liquor are not the same in each plant. The forming of scale or incrustations on the heating surface probably depends among other things on the quality of pulp cooked, the acid used, the quality of limestone, and the quality of sulphur and/or pyrite. It is naturally of importance, too, as regards scale forming, whether the liquor to be evaporated consists of waste liquor direct from the digester, whether it is neutral-

OLIVER *Ringvalve* VACUUM PULP FILTERS



38 already in operation as kraft or bleached stock washers and deckers.

7 companies already have placed repeat orders.



Send for Folder F-106 for further details.

The basic soundness of design and evident superiority in operational advantages appealed originally to these buyers of the "Ringvalve" Filter. But the real "proof of the pudding" has been well-expressed in the repeat orders from seven of the companies after operating their original units for many months, some well over a year.

The Oliver Ringvalve Filter is a capital investment as are all Oliver Filters for pulp and paper. It stands to reason that no company is "*repeating*" its order for the Oliver Ringvalve Filter if not convinced by its own experience of the economical and operational superiority of the Ringvalve.

You should check its value for any of the following services in your mill: black liquor washing, bleach washing, deckering, decker-washing, high density thickening. You should look into its advantages for counter-current washing of kraft stock.

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ized, or whether it is slop from an alcohol plant to be handled in the evaporation plant.

As far as I can see, the experience from Swedish plants shows that difficulties with scale forming become greater the higher the temperature and the denser the liquor. It is, of course, very important that a high velocity of the liquor be maintained in the evaporators or heat exchangers.

Under certain conditions it is not possible to avoid scale forming on the heating surface. Several methods have been used to remove such scale. As the scale consists, to a great extent, of water soluble calcium sulfate, it is possible to clean the heating surface from scale in some cases by washing it with water. This method is sometimes practiced.

Roseblads have devised a special method for dissolving the scale and in their evaporator the media is switched from one spacing in the heat exchanger to the other in such a way that the liquid to be evaporated passes through the spacing where previously the heating medium circulated, and vice versa. From plants operating on an industrial scale it has been found that the acid condensate which is formed when steam from one evaporation stage is condensed in another, can dissolve the incrustation in a rather short time as compared with the period during which the scale was formed.

The effect of this kind of washing can be intensified in each evaporator by circulating the condensate from the condensate outlet into the steam inlet.

As herein pointed out, the quality of the liquor in one plant may differ very much from that in another and consequently it is, as a rule, not possible to anticipate the scale forming conditions in one plant on the basis of the experiences in another plant.

It seems to me that the best thing would be to install trial apparatus in order to investigate the scaling problem before any expensive installation is decided upon.

It might be possible that in time to come we will learn enough so that sufficient guarantees can be given based on the analysis of the liquor and other information about the expected operating conditions, but in my opinion we are not there yet.

As mentioned, we have not had any special difficulty so far in regard to the burning of the liquor but in order to meet all problems which may be anticipated — for instance, in handling the ashes and possibly the sulphur in the flue gases, the pulp industry in Sweden appointed a committee some months ago for a detailed study of these problems, and I hope their findings will be available within a few months.

ECONOMIC AND MARKET ASPECTS OF ETHYL ALCOHOL FROM WASTE SULFITE LIQUOR

By Rayburn D. Tousley

Associate Professor of Marketing,
State College of Washington, Pullman, Washington.

In evaluating the economic prospects for developing in the Pacific Northwest an industry producing ethyl alcohol from waste sulfite liquor, an analysis must be made of at least three economic elements: the cost of production, the availability of markets, and the price that may be obtained for the product. In the final analysis, the success of the industry will probably depend upon the availability of markets. However, let us consider first the alcohol industry as a whole and then examine the various economic factors that will determine future development.[1]

Prewar Status of the Industrial-Alcohol Industry

The average annual production of ethyl alcohol for the period 1936-1939 amounted to approximately 106,000,000 wine gallons, which quantity was only some 6,000,000 gallons above the average annual production for the period from 1926 to 1929. Of this total production, about 89,000,000 gallons were withdrawn annually for denaturation (i.e., for industrial use), from which were produced on the average approximately 98,000,000 gallons of denatured alcohol. During 1940 and 1941, the production of ethyl alcohol increased substantially, amounting to almost 156,000,000 gallons in the latter year.

Statistics on the production of denatured alcohol indicate that there has been for a number of years a steady decrease in the use of completely denatured alcohol and a corresponding increase in the use of specially denatured alcohol. The production of completely denatured alcohol, used mainly as an antifreeze, amounted to less than 17,000,000 gallons in 1939 compared with almost 66,000,000 gallons in 1926. On the other hand, the production of specially denatured alcohol increased from some 39,000,000 gallons in 1926 to more than 82,000,000 gallons in 1939. The specially denatured product was used before the war principally as a solvent and as a basic raw material in chemical manufacturing.

Prior to the war, over 90 per cent of the total production of ethyl alcohol was obtained by the fermentation of blackstrap molasses and the synthesis of ethylene and other intermediate gases. About two-thirds of the total annual output was produced from molasses in 1939 and 1940, but it is significant that this proportion had declined steadily since the early 1930's. The production of synthetic alcohol increased correspondingly during this time, amounting to about 25 per cent of the total output in 1939 and 1940. The remaining quantity of alcohol was produced mostly from grain.

The prewar production of ethyl alcohol on the Pacific Coast was confined almost entirely to the state of California and amounted usually to less than 3,000,000 gallons per year. There are normally three molasses plants operating in that state, all of them utilizing Hawaiian blackstrap. The excess capacity of these plants is believed to be large, probably as much as 100 per cent of prewar production. The limited production on the Pacific Coast before the war, therefore, was caused primarily by lack of markets rather than by lack of productive capacity.

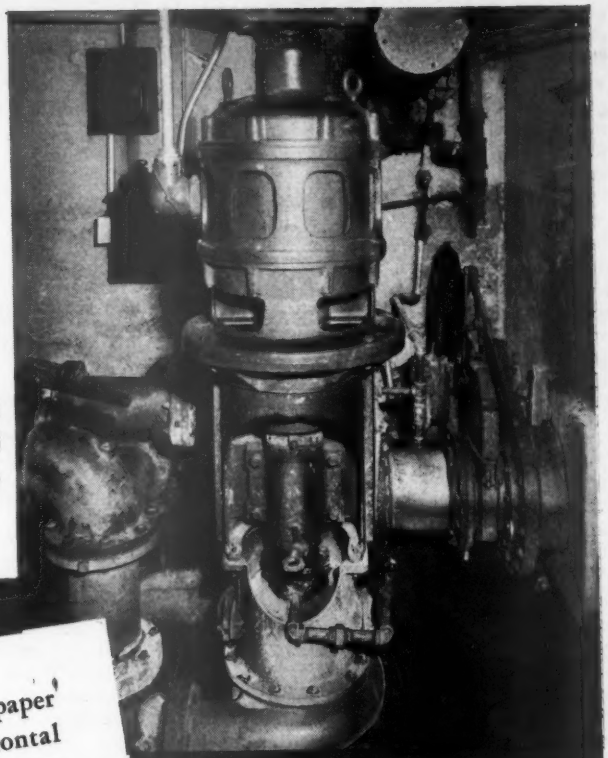
Wartime Changes in the Alcohol Industry

The impact of the war upon the

[1]For greater detail and original sources, see R. D. Tousley, **The Economics of Industrial Alcohol**, Bureau of Economic and Business Research, State College of Washington (Pullman: August, 1945).

Vertical
STOCK PUMPS

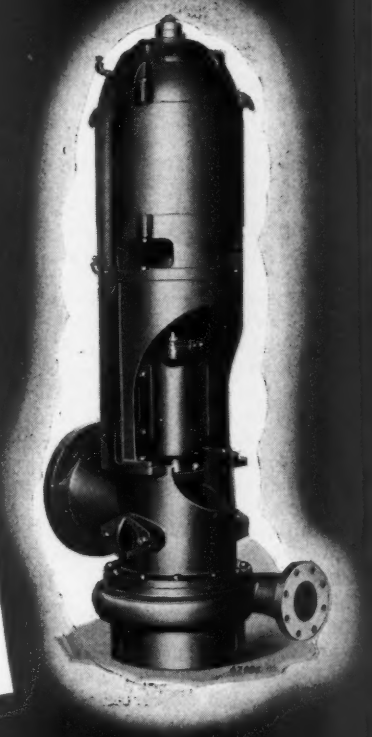
For Blow Pit . . . Bull Screen . . . Brown Stock . . . High Consistency Deckered Stock . . . Heavy Bleached Stock . . . Broke . . . Machine Feed . . . Couch Pit, etc.



Ingersoll-Rand vertical pumps for handling paper stock have definite advantages over horizontal pumps for certain installations. The entire pump may be submerged below the bottom of the stock chest. In designing new mills, this permits lowering the stock chest. In existing mills it often solves troublesome problems caused by lack of head on the pump. In addition very little foundation is required and the motor is well above the floor and possible flooding.

Other features which contribute to long life, high efficiency, and easy maintenance are: liberal suction areas, impeller is easily adjusted to compensate for wear, renewable shroud, impeller and bearings are interchangeable with I-R horizontal stock pumps.

An I-R engineer will be glad to tell you more about either vertical or horizontal stock pumps. Ask him for a copy of Bulletin 7022 describing units for all pulp and paper mill pumping jobs. Ingersoll-Rand Company, Cameron Pump Division, 11 Broadway, New York 4, N. Y.



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alcohol industry was very great. Demand increased from the prewar level of 106,000,000 gallons per year to a level in 1944 of 606,000,000 gallons. Part of this increased demand came from greater consumption in the normal prewar uses (for antifreeze, as a solvent, and in chemical manufacturing), but most of it came from direct military uses (smokeless powder and chemical-warfare gases), exports under Lend-Lease, and the production of synthetic rubber. Of particular importance was the synthetic-rubber program, which utilized more than half of the total 1944 production of ethyl alcohol.

In order to meet this greatly increased demand for alcohol, it was necessary to expand production wherever possible. Beverage-alcohol distilleries were converted entirely to industrial alcohol during 1942. In addition, several new industrial-alcohol plants were authorized by the War Production Board between 1942 and 1944. These new plants included several designed to use grain, one utilizing waste sulfite liquor, and one utilizing wood waste (construction of the latter had not been completed at the end of the war). As a result, total production of ethyl alcohol in 1944 amounted to 566,000,000 gallons—40,000,000 gallons less than consumption. Most of this deficit was met by the importation of 33,000,000 gallons of alcohol.

During wartime, grain took the place of molasses as the most important raw material for the production of alcohol. Because of a shortage of molasses, grain was used from time to time by some of the regular molasses plants. In addition, the converted beverage distilleries and the new grain plants used it exclusively. In 1944, the production of alcohol from grain amounted to 353,000,000 gallons, or 62.4 per cent of the total output. Production from molasses constituted 153,000,000 gallons, or 27 per cent of the total, whereas the production of synthetic alcohol amounted to 60,000,000 gallons, or 10.6 per cent of the total.

Pacific Coast production of alcohol, like national production, was maintained at a high level during the war period. California molasses plants produced about 8,000,000 gallons in 1943, and converted wineries added some 3,000,000 gallons The new waste-sulfite-liquor plant at Bellingham, Washington, began operation early in 1945 and was expected to produce annually about 2,000,000 gallons. The wood-waste plant at Springfield, Oregon, would have produced an additional 4,000,000 gallons per year if construction had been completed. Most of this increased production was consumed in other areas; demand on the Pacific Coast did not keep up with the increased volume of production.

Alcohol Prices

The general trend of alcohol prices during the decade of the 1930's was steadily downward. From levels of more than 40 cents per gallon between 1927 and 1930, quoted prices of specially denatured alcohol declined to a low in 1939 of 18.5 cents per gallon for formula No. 2-B and 19.5 cents per gallon for formula No. 1. That this decline was not caused entirely by depressed business conditions is indicated by the fact that there was a greater degree of price stability between 1932 and 1935 than existed between 1936 and 1939. Actually, there is close correlation between the price declines of the latter period and increases in the production of synthetic alcohol. There is little doubt that the downward trend of prices during this time was caused, to a considerable extent, by the development of the low-cost synthetic process.

As the demand for alcohol increased during 1940 and 1941, prices rose gradually. On September 15, 1941, alcohol prices were brought under control by the Office of Price Administration, maximum prices being established at the quoted levels then prevailing. Higher costs for molasses, however, made necessary a substantial upward revision of prices on January 1, 1942. Later in the year, a special pricing formula was established for converted beverage-alcohol distilleries. During the war period, alcohol from molasses was priced generally at from 48 to 50 cents per gallon. Alcohol from grain is said to have cost on the average from 90 to 95 cents per gallon. Synthetic alcohol, however, was sold consistently at late 1941 prices—from 25 to 28 cents per gallon. Some synthetic was sold in large quantities for as little as 18 cents even during wartime.

The above prices are quotations f.o.b. eastern works. Prior to the war, it was customary to quote a western differential — that is, to maintain higher prices for alcohol sold on the Pacific Coast than for alcohol sold in other areas. This western differential usually amounted to three or four cents per gallon. Since the Pacific Coast can produce all of its alcohol requirements, it would appear that the differential must have existed either (1) because of a lack of price competition, or (2) because of higher production costs on the Pacific Coast than in other areas. Both factors appear to have some bearing upon the situation.

In the first place, production is concentrated in three plants, all of which utilize molasses as the raw material. There is no competition from synthetic alcohol. On several occasions, western prices have been maintained while eastern prices have been weak. This would appear to indicate a lack of effective competition. With respect to production costs, it is to be noted that Pacific Coast alcohol plants are relatively small and thus may have higher unit costs. Also, it is probable that raw material costs are normally somewhat higher on the Pacific Coast than on the Atlantic and Gulf seaboards. During the war period, Pacific Coast alcohol prices were held at lower levels than those of other areas because of a somewhat lower raw material cost.

Costs of Producing Alcohol

Although several new processes for producing alcohol were developed during the war period, the principal competition for waste sulfite-liquor plants will probably come from the main prewar processes. Synthetic alcohol produced from ethylene probably costs at the present time between 13 and 14 cents per gallon. These figures include the cost of raw material, processing, and depreciation but do not include such items as administrative overhead, selling expenses, freight absorption, cost of denaturation, and profit. There is a possibility that the cost of synthetic alcohol will be even lower in the future. Some believe that the cost of obtaining pure ethylene will be reduced from the present level of about 3 cents per pound to one approaching two cents per pound. If this occurs, the cost of synthetic alcohol will be reduced to about 10 cents per gallon.

The cost of producing alcohol from molasses depends primarily upon the cost of the raw material—which is quite variable. Assuming a molasses cost of 5 cents per gallon, molasses alcohol could be produced for about 15.5 cents per gallon in the more efficient plants. Less efficient plants might run as high as 17 cents or even slightly higher. The average cost would probably be about 16 cents per gallon. Before the war, it is probable that most molasses-alcohol plants were able to obtain molasses at an average cost of 5 cents

per gallon. During the war, molasses sold at considerably higher levels, from 16 to 17 cents per gallon. Most producers of molasses alcohol believe that the cost of molasses will revert to prewar levels within a relatively short time. If the cost of synthetic alcohol approaches 10 cents per gallon, however, molasses - alcohol producers will require either a molasses cost of about 3 cents or a substantial amount of added revenue from by-products. By-product development is receiving a great deal of attention at the present time, and many believe that it will result in a considerably reduced cost for molasses alcohol.

The ability of waste-sulfite-liquor plants to compete with synthetic and molasses plants will depend to a great extent upon technological developments in all three processes. At present, the cost of alcohol from waste sulfite liquor is estimated at from 15 to 19 cents per gallon for large plants (275-300 tons of pulp per day) in the Pacific Northwest. Plants with a capacity of 200 tons of pulp per day would probably have costs of 2 to 3 cents more per gallon of alcohol produced. Further technological developments and a reduction of the high wartime construction and labor costs might reduce these costs by several cents. On the whole, it would appear that the waste-sulfite-liquor process has a good chance to compete with other processes provided readily accessible markets are available.

The Postwar Demand for Alcohol

In discussing the postwar demand for alcohol, it is necessary to consider several factors. In the first place, there is a close correlation during peacetime between the demand for industrial alcohol and the level of business activity. Secondly, there were in evidence prior to the war certain long-run trends with respect to the consumption of alcohol in various uses. Thirdly, wartime developments have resulted in new uses for alcohol (e.g. in synthtic rubber), the peacetime prospects of which are difficult to evaluate.

For a rather indefinite period after the end of the war, perhaps as much as two years, it is probable that the demand for alcohol will continue at a relatively high level compared with the prewar demand. During this period, it is expected that alcohol will continue to be used in considerable volume for synthetic rubber. Also, the consumption of alcohol in the normal prewar uses should be maintained at a high level because of the accumulated demand for many types of civilian products. Thus, an immediate postwar demand for alcohol of 300,000,000 to 400,000,000 gallons per year is likely to be attained.

At a later time, say five years after the end of the war, we may expect a quite different situation. After the transition period and as soon as normal competitive forces are again in operation, we may expect a substantially reduced demand. The consumption of alcohol in the normal prewar uses will probably be above the prewar level but below that of the transition period. Based on well-established prewar trends, the consumption of ethyl alcohol five years after the war in these normal uses might approximate 135,000,000 gallons per year compared with the 1936-1939 average of 106,000,000 gallons. The degree of business prosperity will be an important factor, of course, in determining the level of consumption.

It is not expected that the new wartime uses for alcohol or other new uses will add greatly to the normal peace time demand for alcohol. Competition from natural rubber and from the butylene-dehydrogenation process of manufacturing butadiene for synthetic rubber will probably eliminate rather generally the alcohol process for producing synthetic rubber. The blending of alcohol produced from farm products with gasoline for use as a motor fuel does not appear at this time to be capable of competing economically with straight gasoline. These conclusions are based, of course, on the assumption that prewar competitive conditions will prevail. It is obvious that governmental action to stimulate the production of synthetic rubber from alcohol or to induce the use of alcohol for motor fuel would change them.

The Postwar Supply of Alcohol

The total annual capacity of regular industrial-alcohol plants was increased during the war period by 80,000,000 gallons; this makes a total postwar capacity for the production of industrial alcohol of some 350,000,000 gallons. This quantity, however, is higher than the probable peacetime maximum supply. In the first place, it includes the potential production of the grain plants constructed since the beginning of the war; these plants presumably will not be able to compete successfully during peace time with synthetic-alcohol and molasses-alcohol plants. Secondly, the supply of molasses is normally insufficient to permit the molasses-alcohol plants to operate at capacity. Many of these plants are now equipped to produce alcohol from grain, but they are not likely to do so in normal times unless the price of alcohol is relatively high. Therefore, the maximum annual supply of alcohol from the more economical production processes may be estimated at about 210,000,000 gallons.

This latter figure does not take into account the possibility of new plant construction after the war. Obviously, there is little reason to anticipate a postwar expansion of the molasses-alcohol industry, but there is some possibility that the production of synthetic alcohol may be increased. The synthetic process is the one with the lowest and most stable cost of production. Moreover, the production of synthetic alcohol has shown a continuous upward trend since 1930. The extent to which additional synthetic capacity will be constructed after the war is difficult to say. Several companies are known to be interested, and trade sources expect additional capacity to be built within the next few years. Such a development is likely to provide severe competition for plants utilizing molasses and other raw materials.

For several years prior to the war, the alcohol industry had a producing capacity considerably in excess of actual output. It would appear from the above analysis of demand and supply that the industry will probably operate at capacity during the period immediately following the war. After economic readjustment takes place, however, it is expected that the industry again will be faced with excess capacity. With an annual demand for alcohol of 135,000,000 gallons and no additional plant construction, the amount of excess capacity will be

A Correction We Are Glad to Make . . .

. . . on page 36 of November issue of PULP & PAPER INDUSTRY, at end of article "Nature of Sulfite Waste Liquor," by Dr. Joseph L. McCarthy.

Figures on quantities of sulfite liquor constituents available in Pacific Northwest, as mentioned in the final paragraph of article, are incorrect and do not conform with correct figures in table prepared by Dr. McCarthy and published at the bottom of middle column on same page.

The former were merely "ad-libbed" rough estimates which he offered during Q. and A. period and which he later revised when he had access to complete information on mill effluent. Therefore, this part of final paragraph should be either stricken or made to conform with table.

about the same as that which existed before the war. If the postwar demand for alcohol is at a higher level, the amount of excess capacity will be less; if additional synthetic capacity is constructed, it will be greater.

The Postwar Price of Alcohol

After a decade of decline, alcohol prices reached a low level of 18.5 cents per gallon for specially denatured alcohol, formula No. 2-B (19.5 cents per gallon for formula No. 1), during the middle of 1939. Since that time, prices have advanced substantially, the actual amount of the increase depending upon the process and the raw material used. During the immediate postwar period, the price of alcohol will have to be relatively high in order to stimulate the maximum amount of production. Later, as demand declines and the industry finds itself with excess capacity, the price will fall. If postwar consumption is no greater than prewar consumption or if synthetic capacity is increased after the war, the price of alcohol probably will seek new and permanently lower levels. If the postwar consumption is somewhat greater than prewar consumption, as seems likely, the postwar price for alcohol may not be much, if any, lower than the prewar price. A great deal depends, of course, upon the future cost of production of synthetic alcohol.

Prospects for An Alcohol Industry in the Pacific Northwest

Prior to the war, industrial alcohol was not produced in the Pacific Northwest except for very small quantities, which were produced from potatoes by an experimental plant in Idaho. At present, this region was a waste - sulfite - liquor plant capable of producing 2,000,000 gallons of alcohol per year. If construction of the Springfield wood-hydrolysis plant is completed, total production for the area will approximate 6,000,000 gallons annually. What are the possibilities of retaining or expanding this production?

The raw materials available in the Pacific Northwest for alcohol production include wheat, potatoes, wood waste, and waste sulfite liquor, but at the present stage of development the process utilizing waste sulphite liquor appears to have the best chance of competing in cost with the established processes. Thus, any postwar alcohol industry developed in the Pacific Northwest will probably be confined to the state of Washington, as all of the larger pulp mills of the Northwest are located in that state. If the eight Washington mills with a daily capacity of 200 tons or more of pulp were all to enter the alcohol industry, some 15,000,000 gallons of alcohol could be produced annually. However, considerations of competition and of markets undoubtedly will restrict any such development.

The principal competition for a Pacific Northwest alcohol industry will come from the California molasses - alcohol plants. Waste - sulfite-liquor plants in Washington should be able to produce alcohol at least as economically as the California molasses plants, but the latter have the advantage of being located much closer to the major portion of the prewar Pacific Coast market. Also, there is the possibility of competition from synthetic alcohol after the war. If a synthetic plant is constructed on the Pacific Coast, severe competition will be provided for both the molasses-alcohol industry and the sulfite-liquor industry.

It becomes increasingly evident that the principal problem involved in the establishment of an alcohol industry in the Pacific Northwest is to find a market for the product. Such a market did not exist prior to the war. During the war period, the great national demand for alcohol permitted western producers to sell on the eastern market at a satisfactory price. For a short period after the war, this situation probably will continue, but eventually eastern producers will again be faced with excess capacity and will be competing among themselves for a market. Pacific Northwest producers cannot compete in normal times with eastern and middle - western alcohol in the eastern and middle-western markets.

Nor is it likely that Pacific Northwest producers will be able to dispose of their product on the California market in competition with molasses alcohol produced in California. It is true that the price of molasses alcohol before the war was higher on the Pacific Coast than in the remainder of the nation, but any widespread competition after the war for Coast markets is likely to result in a collapse of this price structure. The size of the prewar California market—less than 3,000,000 gallons per year—and the excess capacity of the California molasses plants are additional reasons for doubting that Washington producers can dispose of their product in California.

The prewar consumption of industrial alcohol in the Pacific Northwest was very small, probably not much more than 150,000 gallons per year. This is not a very broad foundation upon which to develop a local market that would have to absorb at least 2,000,000 gallons of alcohol annually. This task of market development is a very difficult one, but not necessarily impossible. Ethyl alcohol is a basic raw material for the chemical industry. Now that it is available in the Pacific Northwest, there is some possibility of attracting chemical manufacturers to the area. There has been announced recently a process to produce butyl alcohol from waste sulfite liquor. Experimentation is being carried on in other fields. All of this adds to the necessary foundation for an organic chemical industry in the Pacific Northwest.

Undoubtedly, the extent to which there is general industrial development in the area will be an important factor in determining whether a ready market will be obtained. There are many obstacles to the industrial development of the Pacific Northwest, and they will not be overcome easily. But any general industrial development that does take place will tend to provide additional markets for products made from alcohol and, therefore, for alcohol.

Weyerhaeuser Economist

The Parent-Teachers Association, Castle Rock, Wash., heard Everett Barton, economist with the pulp division, Weyerhaeuser Timber Co., Longview, on Nov. 7, on the topic, "New Developments in Use of Forest Products."

He named many of the new uses of wood formerly regarded as waste, discussing plastics formed from wood pulp, the development of products and chemicals from various barks, and the finest bond and document papers created from pulps made at the Weyerhaeuser mills.

Rayonier Expedition

Three Rayonier men recently made a hunting expedition into the wilds around Pullman, Wash. The party comprised L. E. Atwood, supervisor of machines for the Rayonier mills at Shelton and Port Angeles, Wash.; Winston Scott, chief chemist at Shelton, and Girard Eck, assistant chief chemist at Shelton.

Funk Returns

C. S. Funk, a research chemist of Central Technical Laboratory, Crown Zellerbach Corp., Camas, Wash., has returned after three years of duty on a loan basis with Hercules Powder Company, Ordnance plant, Radford, Virginia. He worked as a civilian employe in the Explosives Department.

Mr. Funk returns with a marital status also, having recently been married. Mr. and Mrs. Funk are now living in North Portland where he is at present concerned with special research problems for Western Wax Paper, Portland plant.

STUDIES ON THE ELECTROLYSIS OF CALCIUM BASE SULFITE WASTE LIQUOR

By D. L. Shinn

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(Paper presented at TAPPI meeting, Camas, Wash., Oct. 9, 1945)

As one avenue of approach to the problem in the research of this laboratory (Research lab of Central Tech. Dept., Crown Zellerbach Corp.) concerning the utilization and disposal of calcium base sulfite waste liquor, a thorough study was made of the electrolysis of the liquor; that is, to investigate what might be the results of supplying electrical energy to its decomposition or modification.

A survey of the literature indicated little detailed work to have been done with regard to waste sulfite liquor electrolysis. The elctrolysis of sulfurous acid and metal sulfites has been investigated by Forster and Friessner,[1] Friessner,[2] O. Essin,[3] and Glasstone and Hickling.[4] It was shown that in the case of sulfite solutions, electrolysis results in the oxidation of sulfites to sulfate and dithionate. Relative proportions of the two products depended upon conditions of the electrolysis, there being practically no dithionate formation in acid solution, possibly due to the extremely low concentration of sulfite ions in such a solution. Thus in the electrolysis of raw sulfite waste liquor, it could be assumed that the sulfur dioxide in solution is oxidized almost quantitatively to sulfate.

Composition of Sulfite Liquor

Sulfite waste liquor is a complex mixture, containing, in addition to sulfurous acid and inorganic sulfites, a variety of organic compounds, some of which are in combination with sulfur dioxide. The constituents present may, for convenience, be grouped into four classes of compounds, as follows:

(1) Inorganic compounds. Chiefly sulfurous acid and calcium bisulfite.

(2) Fairly simple organic compounds. Among these would appear methyl and ethyl alcohol, formic and acetic acid, simple ketones, etc.

(3) Carbohydrates. Reducing sugars and cellulose degradation products.

(4) Lignosulphonic acids. These constitute the major portion of dissolved organic material in the liquor. They are present in the form of calcium salts.

The lignosulphonic acids, and probably some of the carbohydrates as well, are loosely combined with sulfur dioxide. This sulfur dioxide, as a result, is altered in its behavior toward electrolysis and chemical reagents, and hence is not considered to be "free" in the sense that sulfurous acid and calcium bisulfite are so considered. It is important to distinguish between the "loosely combined" sulfur dioxide and the more permanently combined sulfur dioxide constituting the sulphonic acid group. Similarly it should be remarked that the term "combined sulfur dioxide," as used in the sulfite pulping industry, refers to sulfur dioxide combined as bisulfite ion. Such sulfur dioxide is "free" in the chemical sense, and will be so classed in the balance of this paper.

Analytical Procedures

Analytical procedures followed in this work were essentially as outlined in TAPPI method 0-403-sm-40. Departure from this scheme of analysis was made only in the determinations of sulfates and of total sulfur content.

In the case of the sulfate determination, a motor-driven glass stirring apparatus was devised for use during the one-hour boiling period required for lignin precipitation. The stirrer was fitted with glass drag links which rested directly on the bottom of the glass container placed on a flat surface hot plate. The motion of these links very effectively prevented bumping, and obviatd the frequent loss of the sample as occurred in the use of a glycerin bath.

In the procedure for th determination of total sulfur, a finely ground mixture of on part $KMnO_4$ and 3 parts Na_2CO_3 was substituted for the $KMnO_4$-NaOH solution called for in the TAPPI procedure. The sample for analysis was pipetted directly onto the dry mixture, followed by ignition in a platinum crucible or an asbestos lined porcelain crucible. An error repeatedly encountered in following the TAPPI appeared to be caused by the fact that the $KMnO_4$-NaOH solution tended to remove the glaze on the inner surface of the porcelain crucible, allowing some of the solution to penetrate the porcelain. This could apparently not be leached out during the subsequent washing out of the crucible contents.

Measurement of Evolved Hydrogen

As was previously indicated, the electrolysis of a solution containing sulfite as anion results in the anodic oxidation of the sulfite, there being no significant reaction at the cathode. In order to determine whether electrolytic reduction might also take place during the electrolysis of sulfite waste liquor, an apparatus was set up permitting the collection and measurement of hydrogen evolved at the cathode during electrolysis. A copper coulometer was connected in the electrical circuit affording a measure of current passing through the electrolysis cell. Raw waste liquor was electrolyzed under these conditions using platinum electrodes, and the volume of hydrogen produced was compared with the amount of electricity passed. It was found that the two quantities were in agreement within the limit of experimental error, indicating that cathodic reduction, if taking place at all, was negligible in extent.

Similar determinations made on sulfite waste liquor which had been made alkaline by the addition of Na_2CO_3 gave the same result, showing that electrolysis, under either acid or alkaline conditions, resulted in no detectable cathodic reduction.

Electrolysis of Raw Waste Liquor

Results of analyses made before, during, and after a typical electrolysis of untreated liquor are shown in Table I. Electrodes were of bright platinum, the anode being cup-shaped, and rotated continuously to provide agitation in the solution. The cathode consisted of a small square of platinum foil. A layer of inert mineral oil was floated on the surface of the liquor to minimize atmospheric oxidation, and loss of SO_2. Electrolysis was carried on at room temperature, with

TABLE I

Electrolysis of Raw Sulfite Waste Liquor At 20° C.

Elapsed Time (Days)	0	2	3	4	5	6	7
Free SO_2 G./L.	1.59	0.00	.....	.....	.....	.....	.....
Loosely Combined SO_2 G./L.	5.04	2.21	1.96	1.71	1.37	1.32	1.30
Total Acid as SO_2 G./L.	6.02	6.30	6.99	7.07	7.46	7.54	8.22
Solids G./L.	126.4	112.7	113.2	113.0	111.9	111.4	108.9
Calcium as CaO G./L.	8.6	5.6	5.2	5.2	4.9	4.8	4.3
Sulfate as SO_2 G./L.	0.88	.....	.....	.....	.....	.....	2.22
Total Sulfur as SO_2 G./L.	19.60	.....	.....	.....	.....	.....	14.97
Sulphone SO_2 G./L.	12.09	.....	.....	.....	.....	.....	11.45
Acetic Acid G./L.	4.25	.....	.....	.....	.....	.....	4.88
Formic Acid G./L.	0.48	.....	.....	.....	.....	.....	0.72
Biochemical Oxygen Demand P.P.M.	29,400	.....	.....	.....	.....	.....	26,950
Lignin (By B-Naphthylamine PPT.) G./L.	54.4	.....	.....	.....	.....	.....	57.6

TABLE II

Electrolysis of Raw Sulfite Waste Liquor At 80° C.

Elapsed Time (Days)	0	1	2	3	4	6
Free SO_2 G./L.	1.61	0.11	0.00	.....	.....	.....
Loosely Combined SO_2 G./L.	5.08	2.88	1.22	0.45	0.45	0.27
Total Acid as SO_2 G./L.	6.21	4.78	5.16	6.45	6.99	7.13
Solids G./L.	125.2	119.5	108.4	107.4	104.9	102.1
Calcium as CaO G./L.	8.5	6.5	4.8	4.4	4.3	3.9
Sulfate as SO_2 G./L.	0.90	.....	.....	.....	.....	2.17
Total Sulfur as SO_2 G./L.	19.5	.....	.....	.....	.....	13.5
Sulphone SO_2 G./L.	11.9	.....	.....	.....	.....	11.2
Acetic Acid G./L.	4.25	.....	.....	.....	.....	2.79
Formic Acid G./L.	0.50	.....	.....	.....	.....	0.85
Lignin (B-Naphthylamine PPT.)	56.5	.....	.....	.....	.....	58.2
Methoxyl Content of Lignin (%)	13.5	.....	.....	.....	.....	10.3

a current flow of 0.2 amperes.

During the electrolysis the solution volume was kept constant by the addition of water.

Analytical data of a similar electrolysis in which liquor temperature was maintained at 80 deg. C. are shown in Table II. A portion of the data of Tables I and II are shown graphically in Figure I. It will be seen that the greatest apparent effect of the increased temperature is a greater current efficiency, the curve being more steeply inclined in the case of the higher temperature. Loosely combined SO_2 appears to approach an almost constant value of about 1.3 g./l. in cold electrolysis, whereas its concentration continually decreases at the higher temperature. The great stability of the sulphonic acid group in the lignin complex is well illustrated by the fact that in hot electrolysis less than 7% of this material is decomposed during 6 days of continual electrolysis. Concerning the behavior of the ligno-sulphonate during electrolysis, it is noteworthy that the concentration of this material appears to increase during electrolysis, as determined by precipitation with beta-naphthylamine. The latter lignin precipitating agent, when used for the determination of lignosulphonate in sulfite waste liquor, results in the precipitation of about 82% of the total lignosulphonate present. It is possible that electrolysis brings about a polymerization in the unprecipitated 18% portion of the lignosulphonate, causing a part of it to form the insoluble beta-naphthylammonium salt. The use of beta-naphthylamine as an analytical reagent in waste liquor analysis after electrolysis appears to be inadvisable.

Carbon Dioxide Evolution

The very considerable decrease in solids content of waste liquor during electrolysis suggests either the partial breakdown of organic compounds to form carbon dioxide and water. To test the latter possibility, a special electrolysis cell was devised in which gases evolved from each electrode were collected and could be analyzed. Preliminary experiments made with this cell indicated very considerable amounts of carbon dioxide to be evolved at both electrodes. In order to determine whether an appreciable amount of the carbon dioxide thus produced had its origin in lignin destruction, a sample of waste liquor was given a preliminary treatment to free it of many of its constituents other than lignosulphonic acid. The raw liquor was brought to a pH of 7.0 by the addition of milk of lime. It was then heated to 90 deg. C. and the pH was again adjusted to pH 7.0. After cooling, the liquor was inoculated with yeast and allowed to ferment in order to destroy the major portion of sugars present. After filtering, the liquor was passed through a column containing a cation exchange resin operating on the hydrogen cycle. By this means the salts present in the liquor (chiefly calcium lignosulphonate) were converted to free acids. The resulting liquor was then electrolyzed for a period of 12 days. Results of the electrolysis are shown in Table III. Assuming the carbon dioxide, and solids loss, to have resulted from lignin oxidation, and ascribing to lignin the formula $C_{10}H_{10}O_3$, the amount of CO_2 evolved represents 39% of the quantity theoretically possible based on loss of solids. The fact that 36% of the evolved CO_2 was collected at the cathode does not indicate CO_2 production at that electrode,

TABLE III
Evolution of Carbon Dioxide During Waste Liquor Electrolysis

		Solids G.	CO_2 from Cathode G.	CO_2 from Anode G.
Before Electrolysis		45.20	.....	.....
After Electrolysis		41.77	1.191	2.116
Total Evolved CO_2	3.307 G.			
Total Loss of Solids	3.43 G.			

TABLE IV
Long Period Electrolysis—Specially Treated Waste Liquor

Elapsed Time (Days)	0	3	9	13	17	22	30	37	63
Loosely Combined SO_2 G./L.	1.97	1.36	0.96	1.02	0.90	0.70	0.58	.....	.....
Total Acid as SO_2 G./L.	10.3	12.0	19.2	15.1	15.6	16.8	16.5	17.1	20.5
Solids G./L.	103.5	100.8	99.4	97.6	96.2	92.1	89.7	84.2	71.2
Sulfate as SO_2 G./L.	0.98	.....	.....	.....	.....	.....	.....	.....	6.03
Sulphone SO_2 G./L.	12.8	.....	.....	.....	.....	.....	.....	.....	8.4
Total Sulfur as SO_2 G./L.	15.8	.....	.....	.....	.....	.....	.....	.....	14.4
Calcium as CaO G./L.	1.14	.....	.....	.....	.....	.....	.....	.....	1.02
Methanol G./L.	0.16	.....	.....	.....	.....	.....	.....	.....	1.00
Ethanol G./L.	0.18	.....	.....	.....	.....	.....	.....	.....	0.55
Acetone G./L.	0.09	.....	.....	.....	.....	.....	.....	.....	0.08
Formic Acid G./L.	0.39	.....	.....	.....	.....	.....	.....	.....	1.43
Acetic Acid G./L.	3.44	.....	.....	.....	.....	.....	.....	.....	4.78
Reducing Sugars G./L. (As Dextrose)	31.6	.....	.....	.....	.....	.....	.....	.....	20.1
Methoxyl Content of Lignin (%)	14.0	.....	.....	.....	.....	.....	.....	.....	1.8

but rather that the gas, dissolving in the electrolyte at the anode, is stripped from the solution by the relatively large volume of hydrogen being liberated. The evolution of CO_2 described above, together with the fact that the lignosulphonate was shown to suffer a decrease in both the sulphone sulfur and methoxyl content (Tables I and II), clearly indicates the lignin to be broken down by electrolysis, at least a portion appearing as CO_2.

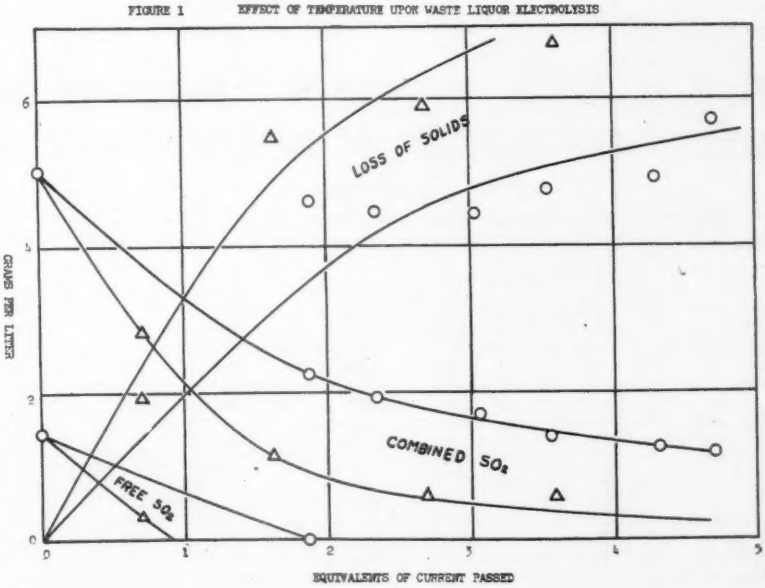
Electrolysis of Pre-treated Liquor

As a further test to observe the destruction of lignin during electrolysis, and to determine the effect of the treatment upon the reducing sugars present in sulfite waste liquor, a sample was electrolyzed continuously over a period of 63 days. Pre-treatment of the liquor consisted of neutralization and heating as described before, followed by passage through a cation exchange resin substituting H+ ions for other cations. The fermentation was omitted in this case, since the presence of the sugars was desired. As described previously, the solution was protcted by a layer of inert oil during electrolysis, and volume was maintained by water addition. The data obtained from this experiment are listed in Table IV. The rate of attack of the reducing sugars appears to be about equal to that of the lignosulphonate, as indicated by disappearance of the sulphone group. Per cent decrease in total solids also approximates the loss shown by the sugars. Increasing amounts of formic and acetic acids, methanol, and ethanol, undoubtedly represent intermediate products in the breakdown of the complex organic compounds present in the liquor.

Electrolysis With Diaphragm

All of the foregoing discussion has concerned electrolysis in which free inter-

FIGURE 1 EFFECT OF TEMPERATURE UPON WASTE LIQUOR ELECTROLYSIS



mixing of anode and cathode solutions was permitted. Under these conditions, relative ion migration velocities are not of importance as factors determining concentrations of the various constituents in various regions of the electrolysis cell. With the introduction of a porous membrane between electrodes in the cell, the relative velocities of the ions under electric stress become of importance comparable to that of the electrode reactions themselves in influencing the compositions of the two electrolyte portions. In the present investigation, electrolysis in a cell fitted with a diaphragm appeared of interest in connection with possible separation of constituents by virtue of differences in migration direction and velocity. Electrolysis experiments were performed with waste liquor initially in both electrode compartments, and in each of the compartments alone. The diaphragm employed consisted of a porous day vessel, with a rotating platinum cup anode inside, and a stainless steel woven wire cathode surrounding the vessel. Table V shows the result of five days of continuous electrolysis, current 0.4 amperes, with untreated waste liquor filling both electrode compartments. Concentrations of free and loosely combined SO_2 diminish in the anode compartment due to oxidation to sulfate, and in the cathode compartment due both to transfer through the membrane and to precipitation with calcium as acidity decreases. The increased concentration of sulfate at the anode would appear to be the only notable case of increased concentration resulting from the electrolysis.

In Table VI are shown analyses of the anode solution at intervals during electrolysis, water and liquor being in the anode and cathode chambers, respectively, at the start. It is interesting to note that after 12 days of electrolysis, the sulphone SO_2 in the anode chamber amounts to approximately half of the total sulfur content of the solution. This is the same ratio as is found in untreated waste liquor. The over-all effect essentially has been a separation of anions by their passage through the clay diaphragm without any decided change in their relative concentrations.

Electrolysis in which the waste liquor was placed initially in the anode compartment only resulted in the precipitation of impure lime at the cathode. Analysis of the cathode deposit showed a sulfur content of about 2.8%, and ash, upon ignition, of 58%. Some anions were apparently diffusing through the diaphragm into the cathode chamber in spite of the electric field produced by the electrolyzing current.

TABLE V

Electrolysis of Untreated Waste Liquor Using Cell Diaphragm

	Before Electrolysis	After Electrolysis: Anode Chamber	After Electrolysis: Cathode Chamber
pH	2.5	1.0	5.2
Free SO_2 G./L.	2.88	0.00	0.13
Loosely Combined SO_2 G./L.	5.47	1.50	0.56
Sulfate as SO_2 G./L	1.78	9.23	0.67
Sulphone SO_2 G./L.	11.00	13.75	2.42
Total Sulfur as SO_2 G./L.	21.13	24.48	3.78
Solids G./L.	122.9	111.4	47.3
Calcium as CaO G./L.	9.34	4.63	3.68

TABLE VI

Electrolysis of Waste Liquor Using Cell Diaphragm. Waste Liquor in Cathode Chamber At Start

	Anode Chamber Analysis		
Elapsed Time (Days)	3	7	12
Total Acids as SO_2 G./L.	6.18	8.30	10.85
Acetic Acid G./L.	0.85	.....	2.16
Formic Acid G./L.	0.40	.....	0.71
Sulfate as SO_2 G./L.	3.37	4.20	5.00
Sulphone SO_2 G./L.	.....	.....	6.11
Total Sulfur as SO_2 G./L.	.....	.....	12.13
Free SO_2 G./L.	.....	.....	0.01
Combined SO_2 G./L.	.....	.....	1.01

Conclusion

Considering sulfite waste liquor as a mixture of compounds which may be roughly classified into four groups, the action of electrolysis may be described as follows:

(1) Inorganic Compounds — SO_2, both free and loosely combined, is readily converted to sulfate.

(2) Simple Organic Compounds—Amounts of methyl and ethyl alcohol, and formic acetic acids are increased. Acetone and other ketones are apparently destroyed.

(3) Carbohydrates—Considering reducing sugars in this class, a very slow decomposition takes place. After two months' electrolysis approximately 2/3 remained untouched.

(4) Lignosulphoneic Acids—A slow desulfonation and destruction of lignin takes place, with CO_2 and water produced in part. Much of the remaining lignin, as determined by beta-naphthylamine precipitation, has been demethoxylated to a considerable extent; almost entirely in two months. Weight of material precipitated by beta-naphthylamine is increased by electrolysis, casting doubt as to the value of this reagent in analysis of electrolyzed liquor.

No significant reaction takes place at the cathode during waste liquor electrolysis.

Separation of anode and cathode chambers by a porous diaphragm results in no appreciable separation of liquor constituents through difference in ion velocities.

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[1]Forster and Friessner. Ber. *35*, 2515 (1902).

[2]Friessner. Z. Elektrochem. *10*, 265 (1904).

[3]Essin, O. Z. Elektrochem. *34*, 78 (1928).

[4]Glasstone and Hickling. Journ. Phys. Chem. *37*, 829 (1933).

FERTILIZING VALUE OF SULFITE WASTE LIQUOR USED ON SOILS IN IRRIGATION WATER

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(Paper presented at TAPPI meeting, Camas, Wash., Oct. 9, 1945)

Waste sulfite liquor (W.S.L.) from the paper industry contains sulfur, calcium, magnesium, and a little potassium, all of which are essential elements in plant nutrition. Since Western Oregon soils often are deficient in sulfur, especially for legumes and other plants with high sulfur requirements, this element supplied by the liquor seems most likely to contribute toward increased growth of crops where the W.S.L. is used on the soil.

The sugars contained in the liquor, on the other hand, could cause a temporary depressing effect upon plant growth. Sugar is energy material for soil organisms which utilize the available soil nitrogen in decomposing the sugars. It might become necessary to use a nitrogen fertilizer with the liquor to overcome this difficulty. For the length of time our experiments have ben conducted, use of nitrogen fertilizer has not been necessary however.

Waste sulfite liquor is acid, as likewise are Western Oregon soils. Use of the liquor would tend toward increasing the soil acidity. The acidity can be corrected by the use of ground limestone rock, or some product containing lime, on the soil, usually at the rate of one to two tons an acre. Since the increase in acidity due to use of the liquor on soils is rather moderate, the cost of liming to correct the condition would not be great.

Since soil humus contains a large amount of lignin, there is the possibility that the lignin in the liquor would contribute toward the build up of soil humus. Here again, some source of nitrogen would probably be necessary for protein formation by organisms in the soil, before an appreciable increase in humus could be expected. The lignin has not yet had much effect on the soil humus in our studies.

Greenhouse studies were made to determine exactly what would be the ef-

fect of wast liquor usd on the soil (Soil Science 49:37-49, 1940). Sunflowers were grown an indicator plants. Rates of treatment were equivalent to 5½, 11, 22, 45, 62, and 84 tons of liquor on 2,000,000 pounds of soil. The 62-tone rate is equivalent to approximately half an inch of the liquor over an acre. The liquor was diluted with water in every case before use on the soil.

Use of the 62-ton rate, and lesser amounts, of liquor increased the growth of sunflowers, but only slightly. Use of a 22-ton rate of W.S.L. as a source of sulfur when other nutrients (nitrogen, phosphoric acid and potash) were added to stimulate bigger yields caused an increased growth of 35%, or about the same increase as when sulfur was supplied from regular sources. The complete nutrient (nitrogen, phosphoric acid, potash) with sulfur supplied by W.S.L. more than doubled the growth of sunflowers compared with no nutrient treatment. Thus the W.S.L. was a satisfactory source of sulfur, when used on the soil to grow plants in the greenhouse, when fertilizers were used and W.S.L. was the only form of sulfur added.

Soil on which W.S.L. had been used was analyzed for water soluble nutrients. A 45-ton rate 10 weeks after application had increased the water soluble calcium more than five times, the sulfate 70 times, and potassium four times. Nitrate nitrogen was depressed to practically zero, due, no doubt, to the activity of organisms which were decomposing sugars in the liquor. The increase in both soluble calcium and potassium may have been due in part to the solvent action of the acid of the liquor.

The liquor treatment also caused appreciable increase in the acidity of the soil. The acidity of the soil immediately after treatment with the liquor was increased by one pH unit. After 10 weeks, there was only half of one pH greater acidity in the soil receiving the liquor. Thus the acidifying effect of the liquor decreased with time.

Field Trials

At the request of the Crown Zellerbach Corp. division at Lebanon, Ore., field trials were made, beginning in 1941, using the W.S.L. on Chehalis silt loam soil to grow various crops. The rates of use were 10, 20, 40, 80 and 120 tons of liquor an acre. The 120-ton rate is approximately equivalent to one inch deep over an acre. The liquor was always applied diluted with irrigation water.

There were four tiers of plots, 32 plots in all counting 12 check plots, and four crops, corn, beans, and cabbage were grown the first year. The yield of beans, 4680 pounds an acre green pods on the check plots, was increased by the 20, 40, and 80-ton rates of use of liquor but not by the 10 or 120-ton rates. The average yield of three of the plots receiving liquor was 50 per cent greater than for the check plots. The yield of green ear corn was 7,757 pounds an acre for the check plots and practically the same for the plots receiving liquor. Cabbage yielded 27,520 pounds an acre on the check plots. All cabbage plots receiving liquor yielded somewhat more than an average increase of 19 per cent over the check plots. The yield of potatoes was 23,840 pounds for the check plots and about the same for the plots receiving liquor. Cabbage and beans are crops with relatively high sulfur requirements while corn and potatoes are not.

Corn, beans, and potatoes were grown

again the second year, switching the crops to different tiers of plots. The fourth crop, sugar beets, failed because of winter killing. All plots were retreated with W.S.L. the second year at the same rates as the first year. The average yield of all three crops the second year were nearly the same where the liquor was used as for the check plots.

The plots were again treated the third year with the same rates of W.S.L. as was used the first and second years. Corn, carrots, and tomatoes were grown. The fourth crop, lima beans, failed to mature, but not on account of the use of the liquor. The crops were rotated on the plots as before.

As before, there was no depressive effect upon yields with rates up to and including 80 tons of W.S.L. per acre. The 120 rate caused some depression in the yields of carrots and tomatoes. None of the treated plots yielded significantly more than the untreated plots.

In the use of liquor and water, four irrigations were applied the first year, a total of 15 to 16 inches of water. In each case where W.S.L. was used, the application was diluted with water. The 80-ton rate was applied, one-half in each of two irrigations, and the 120 rate, one-third in each of three irrigations. The other rates of treatment were applied in one irrigation. Subsequent irrigations were water only.

From the work which has been done to date, it would seem safe to use a 60-ton rate, or half an inch per acre of W.S.L. diluted with water to make a four-inch irrigation yearly on soils. This rate of use could probably be continued for some time without danger.

From the liquor analyses by W. B. Bollen (Pacific Pulp and Paper Industry, Dec. 1942) a 60-ton rate of use of the liquor would add annually to the soil approximately 800 pounds of sulfur, 300 pounds of calcium, 180 pounds of magnesuim, and 16 pounds of potassium, all essential elements of plant nutrition. Of these, the sulfur is probably the most likely to be of value in growing crops since Western Oregon soils often are deficient in sulfur. Liberal use of fertilizers not containing any form of sulfur would provide better conditions for a crop response from the sulfur contained in the liquor.

Besides these elements, a ton of sugars and nearly three tons of lignin would be added annually to the soil. While these latter materials could contribute something to humus build-up and structure improvement in the soil, no data has yet been obtained to verify this assumption.

In order to dispose of W.S.L. in the irrigation water, it would be necessary to have irrigated land near the paper plant. This method of disposal could be utilized only during the irrigation season, and some other disposal would be necessary at other times.

The last two years the Lebanon plots have been seeded to grass and clover, partly because help was scarce during the War. Samples of the soils that have been irrigated five years at the different rates, will be taken and analyzed and some more greenhouse studies will be made to see what effect this liquor has had over a five-year period of time.

If I drew one conclusion now which I might have to change later, I would say it is probably safe to use the liquor in irrigation water to the extent of half an inch per acre, which is the 60-ton rate per year. That much liquor can be pumped into the water for one irrigation, and if used over a period of years it probably would have no injurious effect. And again I will say, if there is any benefit we would consider that more or less incidental and some inducement to the farmer to permit the liquor to be turned into his irrigation system in order to get rid of the liquor.

Herb Heads Canadian Group In Western Canada

Elmer M. Herb, president of Westminster Paper Co., New Westminster, B. C., was elected chairman of the executive committee, western branch, Canadian Pulp and Paper Association, at a meeting in Vancouver December 10. H. M. Lewis, vice president and general manager, Sorg Pulp Co., is vice chairman. H. J. McKenzie is secretary.

Swanz Is Night Superintendent

St. Helens Pulp & Paper Co., St. Helens, Ore., has announced appointment of Herman Swanz as night paper mill superintendent. Mr. Swanz, machine boss, moved up to Merrill Norwood's former place. Mr. Norwood, recently resigned, became paper mill superintendent when Frank Monahan retired.

Positions Wanted by Veterans of World War II

"And so, my fellow countrymen, I report to you that your sons and daughters have served you well and faithfully . . . They are homeward bound . . . Take care of them."—General Douglas MacArthur.

***PULP & PAPER INDUSTRY** offers to publish in these columns — without charge — the "classified advertisements" of bona fide ex-service men and women who have served in any of the armed services of the United States and Canada. We do this in no sense as a repayment for what they have done for us — but merely as a small courtesy which we hope will be of assistance both to them and to the pulp and paper mills of North America.*

WANTED: Supervisory position. A returned veteran (home in Pennsylvania) with past experience of nineteen years in paper industry in executive capacity, would be very grateful for any information with reference to employment in Pacific Coast territory. Reply Box D, Pulp & Paper Industry, 71 Columbia St., Seattle 4, Wash.

WANTED: Position in industrial engineering, purchasing, production control or planning. Discharge from army air corps imminent. Rag-weed allergy requires move from midwest; favors Pacific Coast opportunity. Experience: five years in aircraft industry, operated mercantile business, purchasing agent, production supvr. Box A.

WANTED
ENGINEERING DRAFTSMEN
For design and development of insulation board mill equipment and allied machinery. Permanent position. Experience in design of paper mill equipment helpful but not required. Location south. State availability with complete details of experience. Box 18, Pulp & Paper Industry, 71 Columbia St., Seattle 4, Wash

HELP WANTED—Factory Superintendent for manufacturer of grocery sacks and specialties bags. Capable of taking complete charge. Give full experience and salary. Address Box 20, Pulp & Paper Industry, 71 Columbia St., Seattle 4, Wash.

WANTED to purchase a used Jones Imperial Jordan. Reply Box 19, Pulp & Paper Industry, 71 Columbia St., Seattle 4, Wash.

West Linn Veterans

West Linn, Oregon, mill, Crown-Zellerbach Corp., reports in regard to the reemployment of veterans who were carried on the service roll of the mill, that a total of 104 entered the armed services, and of these, three gave their lives and one was totally disabled. Of the remaining 100, 51 have already received discharges from service, thirty are now at work on their former jobs and others are coming in rapidly. To date, only three have expressed the intention of not picking up where they left off. Two of these are taking advantage of educational opportunities under the G. I. Bill, and the third has determined on an unannounced course of action otherwise.

WANTED: Position as chem. engineer. Desires Pacific Coast connection. Grad. U. of Mich. Seven yrs. with heavy chemical manuf. in engineering, research, production; two years supvr. in manganese plant; one year cellulose products. Box B.

WANTED: Sales position on Pacific Coast. Just returned from 2 years as Seabees officer in Pacific War Theater. Previously was sales executive for prominent Wisconsin and South pulp and paper companies; many years' experience meeting convertors and distributors. Reply Box C.

WANTED IMMEDIATELY—Mill manager for large, modern, bleached kraft pulp mill now under construction. Excellent opportunity for man with experience, initiative and ability. Please reply in detail stating experience, personal history and salary expected. Box No. 23, Pulp & Paper Industry, 71 Columbia, Seattle 4, Wash.

WANTED — Chemical Engineer, experienced sulfate pulping process. Knowledge of stream pollution work desirable. To travel in South. Salary $5,000. Reply Box 21, Pulp & Paper Industry, 71 Columbia St., Seattle 4, Wash.

WANTED: MASTER MECHANIC to take charge of maintenance in tissue mill. Experience in steam problems and general mill equipment preferred. Plant in Northern New York. Reply Box 22, Pulp & Paper Industry, Seattle 4, Wash.

Longfibre Kraftsmen Discuss Corrugated Box

Corrugated box manufacturing from order stage to completed box was the theme of the Longfibre Kraftsmen at their regular monthly dinner meeting at the Longview (Wash.) Country Club, Nov. 14, under chairmanship of Carl Fahlstrom, assistant manager of Longview Fibre Co.

Ed Blood, chief clerk in the box order department, traced the acceptance, entering and servicing of customers' orders. Box manufacturing was explained by Cliff Page, superintendent of the company's box plant. Mr. Page drew on more than 35 years' experience in the box industry to explain machines and various processes. Bob Andrews, safety engineer, and Virgil Sutherling, chief engineer, made talks, and R. S. Wertheimer, resident manager, reviewed progress the past year in short log and pulpwood procurement.

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